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DEPARTMENT OF MINES
HON. P. E. BLONDIN, MINISTER; R. G. McCONNELL, DEPUTY MINISTER.
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Time Perspective in Aboriginal
American Culture, A
Study in Method

BY
E. Sapir



OTTAWA
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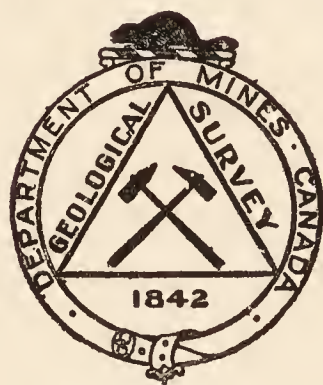
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Time Perspective in Aboriginal American Culture, a Study in Method.

INTRODUCTION: ETHNOLOGY AS AN HISTORICAL SCIENCE.

Cultural anthropology is more and more rapidly getting to realize itself as a strictly historical science. Its data can not be understood, either in themselves or in their relation to one another, except as the end-points of specific sequences of events reaching back into the remote past. Some of us may be more interested in the psychological laws of human development that we believe ourselves capable of extracting from the raw material of ethnology and archæology, than in the establishment of definite historical facts and relationships that would tend to make this material intelligible, but it is not at all clear that the formulation of such laws is any more the business of the anthropologist than of the historian in the customarily narrow sense of the word. If the anthropologist, more often than the historian, has argued from descriptive data to folk psychology, we must hold responsible for this two factors. First, we must take account of the frequent, indeed typical, lack of direct chronological guides in the study of the culture of primitive peoples, whereby he is led to neglect or undervalue the importance of chronological insight and to seek, as a substitute, the unravelling of general laws operating regardless of specific time. In the second place, the cultures dealt with by the anthropologist exhibit, on the whole, less complexity than those made known to us by documentary evidence, whereby he is led to think of the former as less encumbered by secondary or untypical developments and better fit to serve as matter for psychological generalization. Something may also be credited to the fact that the data of the anthropologist give him a view of a greater diversity of cultures than the historian is accustomed to take in at one glance, whereby the former is provided with a truer perspective, or thinks he is,

for the evaluation of the typical in the development of culture in general. These and possibly other factors render intelligible the emphasis on the general and schematic that has to so great a degree characterized the study of cultural anthropology. It cannot be held, however, that the actual data of our science are with more appropriateness to be turned over as a *corpus vile* to the folk-psychologist than the data of the most advanced cultures of to-day. Granting that the labours of the folk-psychologist are justifiable in themselves, the main point remains that so-called primitive culture consists throughout of phenomena that, so far as the ethnologist is concerned, must be worked out historically, that is, in terms of actual happenings, however inferred, that are conceived to have a specific sequence, a specific localization, and specific relations among themselves. Few would be so bold as to maintain that the vast and ever growing mass of ethnological material will ever completely yield to such an historical interpretation, but it is highly important that an historical understanding of the facts be held up as the properly ethnological goal of the student.

Assuming, then, that we are desirous of adopting as thoroughly historical a method of interpretation of aboriginal American culture as circumstances permit, the question immediately suggests itself: how inject a chronology into this confusing mass of purely descriptive fact? All that, in the greatest number of cases, we know about a tribe, aside from scattered information on its external history, covering a relatively short span of time, is that such and such implements and processes were in use, customs practised, and beliefs entertained at a point of time but little antedating the present. Where, as in the case of the Aztec, Maya, and Peruvian cultures, our knowledge is based on the recorded testimony of earlier writers, we are still dealing, in the main, with facts pertaining to a single point of time or, at best, to a brief span of time, too brief to throw much light on the development of the whole culture. Our problem may be metaphorically defined as the translation of a two-dimensional photographic picture of reality into the three-dimensional picture which lies back of it. Is it possible to read time perspective into the flat surface of American culture as we read space perspective into the flat surface of a photograph?

Before being in a position to answer this question, we must be clear as to just what we expect of our time perspective. It is evident at the outset that the nature of our material imposes limitations not felt, or not felt so keenly, by the historian. First of all, we shall to only a very limited extent expect to construct an absolute chronology, that is, assign anything like definite dates. In some cases we shall be satisfied with an approximate date, a margin of error being allowed that may vary from a few years to several centuries, or, in the remoter past, even millennia. In still other, perhaps the majority, of cases, we shall be content to dispense with the assignment of dates altogether and shall aim merely to establish a definite sequence of events. A second limitation is no less clear. One of the characteristic traits of history is its emphasis on the individual and personal. While the importance of individual events and personalities for the progress of human affairs is not to be underestimated, the historical reconstructions of the cultural anthropologist can only deal, with comparatively few exceptions, with generalized events and individualities. Instead of speaking, for instance, of the specific influence exerted by a particular shaman of a tribe at an inaccessible period in the past, cultural anthropology will have to lump together a number of such phenomena and generalize as to the influence exerted by the class of shamans at a more or less well defined time and place. Or, if it is a question of the social relations between two tribes, say the Haida and Tsimshian, it may in a number of cases have to content itself with a broad definition of such relations, taking, for instance, the Haida and Tsimshian as such as the units directly involved, though perfectly aware that the actual mechanism of the relation is in every case borne by individuals, house-groups, or clans, that is, by subdivisions of the historical units ostensibly concerned. A great deal of such substitution of the whole for the part is unavoidable in ethnology. These two limitations must be frankly recognized, but they need not in the slightest obscure the application of historical methods to the field of cultural anthropology. They introduce a purely quantitative, not qualitative, correction into our initial ideal of historical treatment. Often enough, in dealing with an historical process not far

removed from the present, the student will be enabled to follow out the precise course of events and the absolute time (within reasonable limits) of each; he will also be enabled to define clearly the nature of the social units, whether individual or collective, concerned in each stage of the process. Such opportunities to study the dynamics of primitive culture should never be missed; they are not only of specific value in the study of recent phases of the cultural development of a tribe, but afford valuable aid towards the formation of a technique in the historical interpretation of data far removed in time. In the main, however, the gaining of an historical perspective will mean the arrangement in as orderly temporal sequence as possible, within as definitely circumscribed absolute time limits as circumstances will allow, of the processes studied by our science, the carriers of these processes being generally defined more inclusively than in documentary history.

To turn to concrete illustrations. We may wish to ascertain, if possible, whether the movement of certain Siouan tribes (say the Omaha and Ponca) to the western plains was prior or subsequent to the development among them of a particular ritual (say the calumet adoption ritual). Neither the personalities or social units that took the lead in the western movement nor the agencies most immediately concerned in the development of the ritual need ever be successfully worked out; nor may we succeed in assigning a plausible date or range of time to either process. Nevertheless, it is quite clear that if we discover which of the two was first consummated, we shall have acquired a valuable clue (perhaps only a caution) towards the historical understanding of the ritual both in its relations to other cultural complexes within the tribes concerned and to the same or allied rituals in neighbouring tribes (say the Pawnee Hako ceremony). If the ritual can be shown to have developed after the arrival of the Siouan tribes on the plains, we at once begin to suspect the influence of the neighbouring tribes in the origination of the ritual among the former. Or, to take another example, we may wish to work out the relative chronology of origin of such a group of associated phenomena among the Nootka as the thunderbird type of origin myth, the use of the thunderbird in house paint-

ings, the thunderbird dance, the references to the thunderbird in personal names, and the metaphorical use of the term "thundering" to apply to wealth. According to the relative ages determined for these cultural elements, we shall have to construct markedly different theories of their historical relations to one another, to similar phenomena among the Kwakiutl and other neighbouring tribes, and to still other cultural elements of a distinct but allied nature in the same and neighbouring tribes. The importance of setting the data of American ethnology into chronologic relations will no doubt be readily conceded. It is the aim of this paper to call attention to some of the methods that have been or may be employed to determine them.

The evidence at our disposal may be broadly classified into two main heads, direct and inferential evidence. By the former is meant such evidence as directly suggests temporal relations, by the latter such evidence as is inferred from data that do not in themselves present the form of a time sequence. The direct evidence available in American ethnology is, in the nature of the case, well understood and has been employed to a considerable extent. The inferential evidence, on the other hand, is apt to be rather felt than clearly understood and, while it has been not infrequently, sometimes only tacitly, utilized, it is undoubtedly capable of much greater service than generally recognized.

DIRECT EVIDENCE FOR TIME PERSPECTIVE.

DOCUMENTARY EVIDENCE.

The first type of direct evidence is that yielded by historical documents, such as the Jesuit Relations, Cook's Voyages, and a host of other works that will readily occur to every one. During the more than four hundred years that have elapsed since the discovery of America, the native cultures have naturally not been static. Considerable movements of population in certain areas have also occurred. Comparison of statements made at different periods frequently enable us to give maximal and minimal dates to the appearance of a cultural element or to assign the time limits to a movement of population. Evidence of this sort, for

instance, has enabled Wissler to put the important cultural fact of the spread of the horse among the North American Indians on a chronological basis. Similar evidence, again, has enabled Mooney to follow the gradual movement of the Cheyenne from southern Minnesota to eastern Colorado and Wyoming. On the other hand, the mention of kayaks in one of the earliest Norse references to the Eskimo gives us a minimal date for the age of this type of boat. Similarly, a minimal date for the presence of age societies among several Plains tribes (*e.g.* the Mandan) is afforded by such writers as Maximilian and Catlin. The existence in museums of dated ethnological or archæological specimens belongs naturally to the same general type of evidence. Thus, a minimal age for the large split bird-shaped type of Nootka rattle is afforded by the existence in the British Museum of a Nootka specimen of this sort collected by Capt. Cook, one that in no way differs from specimens still in use among these Indians.

Use may also be made of negative documentary evidence, though great caution is, of course, required here. For example, the failure of the earlier writers to refer to the floral designs in beadwork, moose hair, or porcupine quills now thoroughly at home among certain eastern tribes (*e.g.* the Huron, Ojibwa, and Cree) leads to the suspicion that these are of relatively recent origin and due to European influence. The same suspicion in regard to the use of the sail among the West Coast Indians seems justified by its failure to appear in the illustrations of canoes found in the older writers.¹ In neither of these latter cases, however, does the negative evidence alone constitute a demonstration. Scores of other American examples of the significance for culture chronology of both positive and negative documentary evidence will occur to all.

NATIVE TESTIMONY.

A second type of direct evidence is formed by statements, whether as formal legends or personal information, regarding the age or relative sequence of events in tribal history made by the natives themselves. Statements of this sort have been often

¹ I am indebted to Dr. C. F. Newcombe for this observation.

recorded for earlier tribal movements, but are also forthcoming in considerable quantity for the origin and spread of cultural features. When they refer to the distant past, they must be handled with a good deal of reserve, for experience shows that the historical and mythical merge inextricably beyond a certain point. Nevertheless, I believe that there has been in certain quarters decidedly too much of a tendency to make light of all Indian accounts of migration and tribal or clan movements. The village to village movements of clans or septs recorded in various West Coast mythologies, for instance, certainly all have the ring of history or, better said, of legend based on historical events, for the motives and attendant circumstances of such movements are frequently enough fanciful in character. Similarly, if we are told in Hopi clan legends that a particular pueblo received accessions from certain quarters, we need a more powerful argument than a general lofty scepticism to convince us of the total lack of historical value of such statements. The fact that the Tewa pueblo of Hano, situated in the Hopi country of Tusayan, demonstrably traces its origin to the Rio Grande valley should, among other facts of like nature, make us more receptive to the truth of similar movements in the past recorded in native legend. Again, there seems to be no good reason to doubt the substantial correctness of the northern provenience of the Nahuatl-speaking Aztec recorded for us in their legends. The fact that all the remoter linguistic relatives of Nahuatl (Cora-Huichol, Piman, Shoshonean) lie to the north of the historical home of the Aztecs is the best kind of confirmation of these legends.

Native testimony in regard to the provenience or origin of types of implements, social features, rituals, and other cultural elements is frequently of the greatest value in their historical interpretation, apart, of course, from the purely mythical narratives often introduced in connexion with such testimony. When, for instance, the Tsimshian claim to have derived their secret societies from the Northern Kwakiutl, this testimony, fully corroborated by other evidence, throws a flood of light on the relative chronology of the spread of the secret societies among the West Coast Indians. When, further, the Nootka Indians,

while fully acknowledging the Kwakiutl origin of specific dances or songs secondarily woven into their Wolf Ritual, show no disposition whatever to credit the Wolf Ritual as such to the Kwakiutl, this fact does not, of course, disprove such origin, but it leads us to infer that the earliest Kwakiutl influence, if otherwise demonstrated, must reach back to a period considerably antedating the time at which the Tsimshian borrowed the whole complex from the Northern Kwakiutl, again a fact of great chronological value in the study of West Coast ceremonialism. To take another example, there seems to be little or no reason to doubt the accuracy of the Southern Paiute claim that the mourning ceremony, with its peculiar sets of songs, was due to the influence of Yuman tribes to the west, while the Bear dance was much more recently borrowed from the Utes to the north. Thus, native culture, directly studied from the point of view of its own data, does not, after all, present as completely static an aspect as we at first maintained. Certain trends in development are always discernible on closer study. To return to our metaphor, we may say that American culture is comparable not so much to the ordinary photograph as to the long-exposure star chart, in which the immensities of space are indeed reduced to a flat, but in which the extent and direction of movement of the nearer bodies, the planets, are betrayed by short lines.

Brief reference should be made to a special type of native testimony bearing on chronology, the dating of native monuments according to an aboriginal system of chronology. Evidence of this sort is at hand for the Aztec and Maya cultures. These monuments afford almost the only direct references to fixed dates in the remote past that are to be found in aboriginal America. The oldest of these dates, reaching back, for the Maya, to late classical times according to our reckoning, falls far short of the total span of time that we must allow for the development of aboriginal culture on this continent and gives us no appreciable help for the ultimate problem of the earliest occupation by man of America and of the origin of his culture. Nevertheless, the oldest Maya dates are invaluable as affording us some measure of the vast time perspectives lying back of American culture generally, for at the earliest datable period

reached by direct evidence we already are confronted by a highly complex culture, far in advance of and further removed from what we must conceive the earliest American culture to have been than that of many northern tribes of to-day or yesterday. The certainty of a vast lapse of time in which American Indian culture developed on this continent or elsewhere is not impaired by the rejection of all the reputed finds of Tertiary man in America.

STRATIFIED ARCHÆOLOGICAL TESTIMONY.

The third type of direct chronological testimony is afforded by the stratified monuments studied by archæology. Properly speaking, such evidence, the rationale of which is based on the translation of successive deposition of artifacts and skeletal remains into a chronological cultural and racial sequence, is to be classed as inferential evidence, but the justifiability of the inferences as to time sequences is here so clear that it seems proper to consider it as direct. The method has yielded brilliant results in the study of prehistoric Europe and western Asia and is doubtless destined to teach us vastly more than has yet been disclosed to us about the earlier culture history of the rest of the world. For America, however, the results, while of distinct value as far as they go, have so far been rather more meagre than might have been expected. Whether this is primarily due to the nature of the culture history of America itself or to certain defects in the field methods of investigators, I would not venture to decide. Perhaps something is to be charged to both. In support of the former explanation we may point out that America is so vast a stretch of land in proportion to the relatively meagre aboriginal population and, as compared with the old world, of such recent occupancy that the chances of superimposition of cultures and races at a single spot are fairly slim. However, the stratigraphic type of reasoning is not necessarily restricted to cases where we have clearly distinct layers of archæological finds, but may with advantage also be applied to the study of developments within the same culture by noting the relative depth of occurrence of various artifacts. The fruitfulness of this type of research has

been demonstrated by Nelson's discussion of the history of pottery in the Galisteo basin on the basis of the relative frequency of sherds of different types of ware at various levels. I am convinced that the stratigraphic method will in the future enable archæology to throw far more light on the history of American culture than it has done in the past. The results already obtained in this way by Dall's researches in the Aleutian shell-heaps, by Boas' recent study of the various strata of pottery finds in the valley of Mexico, and by Uhle's researches in the Peruvian site of Pachacamac, to mention only a few examples of the use of the method, argue well for its increased usefulness in the future. The correlation of the time sequences thus determined by archæology with those reconstructed from the data of ethnology presents a difficult theoretical problem, but in practice the difficulties are frequently less than might be supposed. That, in general, ethnologic and archæologic data form a cultural continuum, few would now venture to deny.

INFERENCEAL EVIDENCE FOR TIME PERSPECTIVE.

So much for the direct evidence at our disposal for the establishment of time sequences in American culture. The inferential evidence for the same purpose may be yielded by physical anthropology, by the descriptive data of culture (ethnology and archæology, which will henceforth be considered as two aspects of the same science), and by linguistics. It is customary to insist on the mutual independence of racial, cultural, and linguistic factors. This caution of method must, however, not be understood to mean that conclusions of direct value for the history of culture can not be derived from the data of physical anthropology and linguistics. In actual practice the units of distribution of these three sciences, while never coinciding throughout, do nevertheless show significant lines of accord. Thus, while the Plains physical type may not quite correspond in distribution to the Plains culture area, it is obvious that the typical Plains tribes, culturally speaking, are at the same time typical members of the Plains physical type. As we get away from both the culture and type, we simultaneously, though not

necessarily in like degree, experience a shading off into other cultures and types. The dividing line between the Pueblo and Plains Indians is about the same culturally and racially. These homologies certainly represent a significant historical fact. Nor, again, is it without historical significance that the Eskimo linguistic stock, Eskimo culture, and Eskimo race coincide rather closely in distribution. To take still another example, the linguistic break between the Algonkian and neighbouring Iroquois tribes was undoubtedly accompanied by a considerable cleavage in culture also, though the cultural break was not as profound, to be sure, as the linguistic one. That differences in culture ever neatly corresponded to differences of race and language can not be maintained, but I wish to point out that the numerous homologies are of at least as great historical importance as the discordances.

EVIDENCE OF PHYSICAL ANTHROPOLOGY.

We shall first take up the inferential evidence yielded by physical anthropology. A racial peculiarity as such is, of course, of no cultural significance (bodily mutilations, *e.g.*, West Coast or Southeastern head deformations, are, properly speaking, cultural evidence that happens to be associated with racial material), but the simple fact that the bearers of a distinctive culture are often marked off from the bearers of other cultures by a distinctive physical type enables us not infrequently to employ the racial evidence for cultural purposes. The finding of Eskimo skeletal remains in regions no longer inhabited by the Eskimo is, if one prefers common sense to methodological tyranny, enough to establish the former spread of Eskimo culture in that region. Again, the fact that the Montagnais Indians of Lake St. John and the lower St. Lawrence show an admixture of Eskimo physical traits is somewhat indicative of the former occupancy of part of their present territory by the Eskimo, an inference which is confirmed by other testimony. This fact naturally has its importance in the working out of the sequence of Algonkian tribal movements.

A second type of cultural evidence of chronological value is yielded by a statistical side of physical anthropology. I refer

to the relative thickness of population in any given area, whether this is inferred from the number of skeletal remains or directly gathered from the number of inhabitants known to occupy the area at a given time. If a large area is thinly peopled, we are inclined to infer that it has been occupied at a relatively recent period; while the presence of a large population in a restricted area generally argues long occupancy. From this point of view we shall have to conclude that the interior of Labrador was occupied by an Algonkian tribe (the Naskapi) at a time subsequent to the occupancy of the Maritime Provinces by other tribes of the same stock. Similarly, the great Plains area must have been practically unoccupied at a time when Yucatan and the valley of Mexico were already well peopled by a population considerably in advance of a primitive stage of culture; the comparatively late peopling of the Plains is an inference which can be reached also in other ways. The obvious caution to use in connexion with our present mode of reasoning is this, that geographical factors may limit the possibility of the increase of a primitive population beyond a certain point. Thus, the interior of Labrador would not be expected to support more than a sparse hunting population, even if peopled from time immemorial. With all due reservations, however, the value of density of population as an index of length of occupancy of a region cannot be gainsaid. A map, compiled from all the older sources available, showing approximately the relative density of the aboriginal population in different parts of the New World, before conditions were materially disturbed by contact with the whites, is a desideratum. Allowing for the geographical caution, it should throw not a little light on the currents of population in early America.

Though not strictly belonging here, we may also mention the evidence as to density of population supplied by the frequency of archæological remains in a given area. Thus, a comparison of the "thickness" of archæological remains of the Ohio valley with that of the remains of the middle Atlantic seaboard would seem to indicate a greater density of population and consequent priority of occupation for the former. We might conclude from this that the Algonkian tribes of the latter region (the Delaware) moved east to the Atlantic seaboard from the

Ohio valley, an inference for which, as it happens, we have also other evidence.

EVIDENCE OF ETHNOLOGY.

More important for our purpose than evidence derived from a consideration of the data of physical anthropology or the density of population is the inferential chronological evidence derived from a study of American culture itself. Several more or less distinct lines of argument suggest themselves; there are no doubt others, not mentioned here, that may be at least equally fruitful.

CULTURAL SERIATION.

A method that has been often used to reconstruct historical sequences from the purely descriptive material of cultural anthropology is one that may be termed seriation of cultural elements in order of complexity. The tacit assumption involved in this method is that human development has normally proceeded from the simple or unelaborated to the complex. Hence the simpler forms of a cultural element, whether found in the same or several tribes, are often interpreted as of greater age than the more complex ones. Thus, the simple type of totem pole consisting of a single carved figure, found, for instance, among the Nootka Indians, is almost certainly an older type than the more elaborate poles of, say, the Haida and Tsimshian, in which several carved figures are superimposed upon one another; the two-piece fire-drill of so many western American tribes must go back to a remoter period of American or general culture history than either the bow-drill of the Eskimo or the pump-drill of the Iroquois; the unorganized shamanistic practices of the Eastern Cree and other relatively undeveloped Algonkian tribes may well represent an older stratum of religious activity than the more elaborate Medicine Lodge or Midewiwin of the Ojibwa and Menomini; the simple type of suitor myth is doubtless older than the more elaborate form of the same myth found in clan legends; the use of detached amulets certainly dates back to a remoter past than the employment of amulet

assemblages in the form of medicine or war bundles with associated rituals; and so on indefinitely. The argument by seriation is utilized not only in proceeding from the simple to the complex but also in the alignment of cultural elements according to any other logical criterion, the sense in which such alignment is to be read being determined by theoretical motives. Here belong many series that have been constructed to show the development of geometric from realistic designs, the progress in these being not from the simple to the complex but from the logically prior to the logically secondary.

In the absence of outside chronological evidence, a different theoretical bias would make a chronological interpretation of the series in the opposite sense equally plausible; or one might feel constrained to break up the series altogether as determined by subjective considerations and, therefore, historically fortuitous. Evidence derived from seriation is, indeed, peculiarly apt to be controlled by a purely logical or concept-schematizing tendency. It fits in far better with the evolutionary than with the strictly historical method of interpreting culture. It can take little or no account of local or tribal differences or of mutual tribal influences, and thus substitutes for an historical construction a pseudo-historical one which may convince in the abstract but cannot easily be made to fit into an actual historical framework. The danger of the seriation method may be illustrated by an example. The Iroquois and Wyandot, as is well known, were organized into a number of exogamous clans bearing animal names, the members of each clan bearing individual names also characteristic of the clan. The clans, moreover, were grouped into two exogamous phratries. Now the neighbouring Mississauga, an Ojibwa tribe, were also divided into exogamous clans bearing animal or plant names, each of the clans being again characterized by sets of individual names. So far as we know, however, the Mississauga clans were not grouped into phratries. The seriation method of reconstructing culture history, proceeding from the simple to the complex, might well interpret these facts to mean that the Mississauga type of social organization was the older and that the phratric complication of the Iroquoian organization was a later development. Evidence derived from

a study of Ojibwa social organization, however, would lead one to conclude that the Mississauga organization was, on the contrary, merely borrowed in simplified form from that of the Iroquois, so that, as far as the relation between the Iroquois and Mississauga is concerned, the more complex type of organization, the clan-phratic, must be considered the older.¹ In spite of its inherent weakness as an historical method, there is no doubt that seriation can yield very valuable historical results. It is probably at its best in the construction of culture sequences of the simple-to-complex type in the domain of the history of artifacts and industrial processes, particularly where the constructions are confined to a single tribe or to a geographically restricted area.

CULTURAL ASSOCIATIONS.

I believe that a powerful method for the determination of the relative ages of cultural elements is the study of the associations that they form with one another, no matter whether these associations are of an organic (logically intelligible) or of a purely fortuitous character. There are several points to consider here. It is perfectly evident that the various elements and complexes that go to make up the whole of a culture are never isolated phenomena but that they enter into all sorts of relations. Some are necessary or demonstrable consequences of others, some are only different forms of a single underlying idea, still others are only externally connected.

Principle of Necessary Presupposition.

The first principle of chronologic reconstruction to observe is that elements which are presupposed by other elements or complexes are necessarily earlier in age than the latter. A very simple application of this principle is the determination of the relative ages of the art of dressing skins and the buffalo-skin tipi of the Plains Indians. This type of dwelling was already firmly

¹ These remarks must not be misinterpreted to mean that the Iroquois phratry is necessarily an older social unit than the clan. The relative ages of the phratry and clan among the Iroquois themselves is, of course, another problem altogether.

established among the Plains Indians when first met by the whites but it is clear that a well-developed technique of fleshing and dehairing the hide and of rendering it pliable (presumably by the application of deer brains soaked in water) was necessary before the buffalo hide could be utilized as tipi cover. Hence we conclude that the technique of skin dressing common to many American tribes belongs to an older stratum of Plains culture than the buffalo-skin tipi.¹ Two of the most widespread and probably among the oldest elements of North American culture are the woven rabbit-skin blanket and the throwing-stick used in hunting the rabbit. There are, of course, other methods of securing the rabbit than by means of the throwing-stick, *e.g.*, the snaring method, so that the inference as to the greater age of the throwing-stick is not absolutely required by the facts. Nevertheless, the throwing-stick is so simple and characteristic an instrument for the purpose that I would hazard the thesis that it carries us back farther into the past than the woven rabbit-skin blanket. This would receive strong confirmation if it could be shown that the technique was originally developed in the southern plateaus (say among the Shoshonean tribes) and gradually spread north and east. Of this, however, there is no proof. One of the most characteristic and widespread Eskimo designs is the circle and dot, with which the concentric circle design is probably closely connected. It is clear that practically the only method which the Eskimo could employ to produce these designs is the drill. Hence the Eskimo circle and dot and concentric circle designs, old as they probably are, are younger than the drill itself. The Blackfoot medicine-bundle rituals always centre around a manitou experience, hence they are doubtless of much more recent age than the development of the typical American manitou experience itself.

The caution that must be borne in mind in the use of this principle of necessary presupposition is this, that a cultural element may be borrowed by a tribe without its chronological antecedent. Thus, the use of a cultivated variety of tobacco as a

¹ The question of whether the general type of conical tipi with pole foundation, of which the northern Algonkian conical birch-bark lodge is an example, is also of later origin than the skin-dressing technique, is, of course, not necessarily involved.

religious offering may be adopted without the cultivation of the tobacco plant itself, though the latter is a necessary cultural antecedent, for the tobacco may be regularly purchased by the tribe adopting the custom. Or the chronological antecedent may be replaced in the borrowing tribe by an equivalent, so that the chronological sequence established does not hold for the entire area considered, but only for a part of it. Thus, a decorative design which arises in one tribe as conditional to a certain technique may be freely adapted by the borrowing tribe to another technique.

Reflection of Cultural Elements in Others.

A second type of association of culture elements is similar to the first but differs in that the sequence determined is not a necessary one. I include here all cases in which one of the cultural elements forms the subject matter, as it were, of the other. If this "subject matter" forms an integral part of the new formation, if it is not a secondary or accessory feature, it must be assumed to have preceded the latter in origin. We may then speak of an older element of culture as being "reflected" in a later element or complex. Thus, the self-torture characteristic of the Sun Dance of the Plains is evidently an old practice which has become specialized in a definite setting; it is probably considerably older than the Sun Dance complex itself. Its age as an element of American culture seems further indicated by its occurrence in other connexions among the Kwakiutl and Nootka Indians, though independent origin for the two areas is not inconceivable.

Excellent examples of the "reflection" of older elements in later forms are afforded by references to implements, customs, or beliefs in myths. The more frequent and stereotyped such a reference, the more reason, generally speaking, we have to assign the cultural element great age. Thus, the frequent references in Nootka family legends to whaling adventures is very good evidence of the antiquity of whaling among these Indians and show it to be older than a certain type of family legend itself. Conversely, the persistent failure of certain ele-

ments of culture to find mention in a representative set of myths is often good evidence, despite its negative character, for their comparatively recent origin. The fact that the Nootka Ts'ayeq or doctoring ceremony is never mentioned in the legends is good reason, despite its importance in the religious life of the people, for believing that it was introduced among these Indians at a later period than, say, the Wolf ritual or whaling rituals; this is confirmed by the fact that the more northern Nootka tribes lack the Ts'ayeq.

Place names and individual names are also sometimes useful as gauges for the relative ages of culture elements. To use the Nootka Indians once more, the fact that so many more of their individual names refer to whaling and whaling feasts than, say, to Wolf Ritual dances or potlatching, would seem to indicate a greater age for the former than for the two latter. Similarly, one cannot but admit that agriculture must have been practised by the Hopi for a very great length of time indeed, for so large a proportion of their individual names to refer to corn culture. In general, any well defined style or traditional mode of treatment is apt to embody an old culture element.

Relative Firmness of Association.

A third method of utilizing the association of culture elements for chronological reconstruction is the relative degree of firmness or coherence with which they are attached to a complex. The firmer the association, the older the culture element; the looser the association, the more recent the culture element, at least in that particular connexion. In this way the obviously composite nature of many culture complexes, such as myths and rituals, can, under favourable circumstances, be resolved into a time sequence; in other words, the genesis and development of a culture complex may, to a certain extent, be read out of its own structure. That, *e.g.*, the Beaver bundle ritual of the Black-foot, at least in its present form, is of later origin than the Sun Dance is suggested by its loose superimposition upon the Sun Dance complex itself. An instructive example is afforded by a comparison of the relative importance or constancy of different

dances in the elaborate complex of dances constituting part of the Nootka Wolf Ritual. The great majority of these have properly nothing to do with the essential nucleus of the whole ceremony. Two of the dances are wolf dances and are probably the oldest of the set. A certain number of others, while not relating in any way to the wolf, are nevertheless typical dances of the whole ceremonial and are generally performed; these, while probably more recent than the wolf nucleus of the ritual, are no doubt of fairly considerable age. Finally, a large number of dances are so external in character to the ritual, that we must conclude them to be of late origin. Among these dances is to be included the Cannibal dance, which, indeed, we know from other evidence to be a recent acquisition from the Kwakiutl. Another example of an accessory and, therefore, late element of culture is to be seen in the vegetable foods of the Southern Paiute. Their main dependence for foods of this sort was on the large number of wild plant varieties (roots, seeds, cacti, pine-nuts) that they gathered and prepared in various ways. Nevertheless they were not entirely ignorant of agriculture even before the coming of the whites; they raised small patches of corn, beans, and sunflower seeds in a desultory way. The accessory character of Southern Paiute agriculture stamps it as a borrowing of no great antiquity from the Pueblo tribes to the south. An interesting type of accessory features is the explanatory (etiologial) elements of many American myths. These are in doubtless every or nearly every case of later origin than the plots of the myths.

Maladjustment of Culture to Environment.

In comparing a culture element or complex of one tribe with the related element or complex of a neighbouring tribe, we are sometimes struck by the fact that, despite its possible importance and elaboration in both, it seems somehow to be more at home in one than in the other. This is sometimes due to the fact that such a culture element or complex fits better into one geographical or cultural environment than the other. Thus, the sociological fact that the grizzly bear as crest is more in evidence among the

Tlingit and Tsimshian than among the Haida, though it is well established among the latter too, is almost certainly to be connected with the geographical fact that the grizzly bear is not found in the Queen Charlotte islands, the home of the Haida. We may safely conclude that the Haida grizzly bear crest is a borrowing from the mainland tribes. Conversely, the killer-whale, though one of the most important crests of the Tsimshian, does not occupy anything like the place in social organization and beliefs that it does among the Haida, among whom it is the chief crest of one of the two phratries. Once more, it seems safe to conclude that the Tsimshian Indians borrowed the crest from the Haida and to connect the predominance of the killer-whale among the Haida with the fact that they are an island people, who would, therefore, be brought into closer contact with so characteristic a denizen of the deep as the killer than the mainland tribes. Similarly, the clumsy elm-bark canoe of the Iroquois seems less adapted to its cultural environment than the various types of birch-bark canoe of their Algonkian neighbours. We may risk the guess that the Iroquois bark canoe¹ is an imperfect copy in elm-bark, a characteristically Iroquois material, of the superior Algonkian types, and connect this further with the general cultural consideration that the Iroquois were rather more inclined to be cross-country walkers than the neighbouring Algonkian tribes, who were more adept river and sea folk. The type of chronological reasoning based on the transfer of a style or technique suitable to one material, to a material more easily accessible in a neighbouring region, is too well known to need comment.

The argument from geographical or cultural fitness may open up wide vistas of historical interest. I shall refer to only one speculative problem of this type. One would imagine from the great importance of the thunderbird motive in West Coast culture, particularly in the southern part of the area, that the thunderstorm is a striking phenomenon in that part of the world. As a matter of fact, it is nothing of the kind. Only once in a great while, generally during the winter, one may hear a light rumble from the direction of the mountains. May we conclude

¹As contrasted with the shallow dug-out, probably an older type of Iroquois water craft.

from this that the thunderbird as a mythological motive gradually filtered into the West Coast, at a remote period in the past, the path of borrowing proceeding perhaps from the Eastern Woodlands and Plains, where the thunderbird motive is environmentally justified, across the western plateau, down the Columbia to the Pacific coast, and north to southern British Columbia?¹ Or would it seem more justifiable to consider the West Coast thunderbird motive as a heritage from a region of former occupancy in which its development could be more appropriately explained? In either case, we are impressed by the value of features of cultural maladjustment for inferences as to borrowing or tribal movement.²

Frequency of Association.

A fifth method of studying culture associations for the purpose of reconstructing relative chronology is the noting, not, as in the preceding methods, of the character of the single associations, but of the frequency with which a particular culture element is associated with others. The more frequently an element is associated with others, the older, generally speaking, it will be felt to be. Our own feeling, for instance, that Christianity is an older historical development than, say, the locomotive, is not based altogether on the direct documentary evidence accessible to the inquirer, but, to a very considerable degree, on the far greater number of connexions (worship, ethical ideals, literature, plastic art, music, social prerogatives) into which the former enters in the whole of our culture. One feels that it takes considerable time for an element of culture to become so thoroughly ramified in the cultural whole as to meet us at every step. Such fundamental elements, as they are generally felt to be, are very frequently also the oldest, though not necessarily, of course, in all or even any of the forms in which they actually present themselves. A familiar example of such a fundamental, though not perhaps particularly striking, cultural trait is the

¹ This path of borrowing would explain the absence of the thunderbird motive in California.

² It should be carefully noted that the above remarks imply a relation of environment merely to the *content*, not the *forms* of culture.

emphasis among the Pueblo Indians on the four cardinal points. This emphasis is apparent in myth, ritual, and details of social organization, and is graphically expressed in sand paintings and otherwise. As a basic idea in Pueblo culture its extreme age can hardly be doubted. Similarly, the use of four as a ceremonial number in many American cultures; the notion of hereditary privileges in the male or female line among the West Coast Indians; the manitou dream or vision nearly everywhere in America; the grouping into moieties found in so many tribes, are all basic ideas which doubtless go back to a remote period, whether in American culture as a whole or, at least, in certain areas.

It is important to observe that a culture complex or element may take a prominent or even fundamental place in the life of a community and yet betray its relatively recent origin or introduction by its failure to enter into many associations with other elements or complexes. From this point of view, for instance, the decorative art of the Utes, despite its exuberance of development, does not impress one as being of great age. The Peyote cult of several Plains tribes is another such culture complex which, by its failure to enter into many culture combinations, leads to the supposition that it has been only recently introduced, a conclusion that is in this case directly given by documentary evidence. The cumulative-association method, as we may call it, is surely destined to play an important part in historical constructions, as it has already, more or less tacitly, done in the past.

Cultural Elaboration and Specialization.

Mere elaboration of detail is not itself sufficient to establish the age of a culture complex, as experience shows that an elaborate technique or ritual may be borrowed *in toto*. Favourable circumstances, moreover, such as the influence of a powerful personality, may greatly accelerate such elaboration; witness the rapid growth of the Ghost Dance ceremonial in recent times. However, quite aside from the question of cumulative associations, the more elaborately developed of two culture complexes of a tribe may generally lay claim to the greater age. Thus,

the more complex medicine bundle rituals of the Blackfoot, such as the medicine-pipe, otter-bundle, and beaver-bundle rituals, are undoubtedly of greater age than many or all of the simpler ones. A useful distinction may be made between true or inner elaboration of detail and a superficial quantitative elaboration which often accompanies mushroom growth. As an example of such pseudo-elaboration may be cited the great number of versions of the origin legend of the Cannibal Dance current among the different Kwakiutl clans and tribes. It would be a mistake to lay much stress on the existence of these various versions as a proof of the age of the ceremonial (except from the point of view of geographical distribution, of which more anon), for they are evidently in large measure copied from one another. For this reason, among others, the clan legends of the Kwakiutl, which appear to show more variation, are doubtless older as a class than the ritualistic origin legends.

Considerable importance may often be attached to great specialization of form or technique as a sign of age, not so much of the specialized form as such as of the type of action or thought itself. The specialized weaving product known as the Chilcat blanket, for instance, while not necessarily of great age in its present form, undoubtedly presupposes a long period of development from simpler origins. Even without having recourse to a comparison of the Chilcat blanket weaving with the weaving of neighbouring tribes (*e.g.*, the Salish dog's hair blanket with geometrical designs), we shall have to conclude that the weaving of mountain-goat wool blankets among the Tlingit goes back to a respectable antiquity. It is particularly in the comparison of the same culture complex in different tribes that the argument from degree of elaboration finds useful application. As a rule, the complex is oldest in the tribe in which it has received the greatest elaboration. Thus, the peculiar association of myth and song so characteristic of the Mohave, Yuma, and doubtless other Yuman tribes of the Colorado, is also found, if apparently in rather different form, among the Southern Paiute tribes to the east. The elaboration, however, seems so much greater among the Yuman tribes that we may justly suspect the Paiute to have borrowed the idea of the sung myth (restricted among the Paiute

to the dialogue portions of the myth) from the Yuman tribes. Again, the more intensive agriculture of the Iroquois as compared with that of their Algonkian neighbours implies that the latter learned the art at a later date than the Iroquois.

Cultural Survivals.

The seventh and last method of chronological reconstruction that makes use of the association of culture elements and complexes is the method of survivals, which has been so plentifully, one might almost say abusively, employed by evolutionary ethnologists. By a survival, I do not mean an element which is wilfully, or according to some general theory, construed to be the remnant of some more elaborate complex that is believed on general principles to have disintegrated in the tribe under consideration, but merely an obscure or isolated belief, custom, myth-episode, or other culture element that seems rather out of its context, as though its full content had been lost and it no longer stood in thoroughly intelligible relation to the rest of the culture. Survivals are particularly apt to be such customs or beliefs as are blindly accepted by the native without attempt at rationalization (reinterpretation). Taboos of various sorts, for instance, often belong here. The nucleus of the Nootka puberty rite for girls, to take another example, consists of a number of rigidly prescribed ceremonial acts whose meaning is no longer understood by the Indians and which they do not attempt to explain. This nucleus may be termed a survival complex and is undoubtedly older than the rest of the puberty ceremonial, much of which belongs to the rationalized stock in trade of the Indian. A survival may sometimes hark back to a practice of daily life superseded by a later one, as when, in a ceremonial, entry into the house must be made through the smoke-hole. Survivals, if we can only be sure we really have them, are of great historical interest, as they undoubtedly reach back far into the past. Survivals may, however, be only apparent, so that great caution is needed in the utilization of them. An element of culture may be merely borrowed from another tribe in which its setting is perfectly plain; becoming detached

from this setting, it may appear as an isolated survival-like element in the borrowing culture and deceptively suggest great age. Or the element may appear as a survival merely because all the descriptive data required for its elucidation have not been recorded.

GEOGRAPHICAL DISTRIBUTION OF CULTURE.

So far the inferential evidence derived from ethnological data (by the seriation and association methods) has been gained from a consideration of the cultures, complexes, and elements themselves and in their mutual relations. There remains a third method, in many ways the most powerful of all. This is the method of inference from the geographical distribution of cultures and culture elements. We may either take the distribution of a single element or complex, determine the mode and extent of such distribution, and attempt to interpret the geographical evidence in terms of a time sequence; or we may take a so-called culture area as a whole, see what elements of resemblance and difference it has with other areas, and thus aim to get a glimpse of remoter time sequences. Needless to say, these two tasks are not clearly marked off from each other but, on the contrary, cross in various ways.

Diffusion of Culture Elements.

CONTINUOUS DISTRIBUTION FROM A CULTURAL CENTRE.

Generally speaking, the geographical distribution of a culture-element is continuous. It may stop abruptly at a prominent geographical barrier, such as a mountain range or desert tract, or send out spurs along favourable lines of communication, such as navigable streams or easily traversed coast lines, but, on the whole, the area of distribution tends to be a compact land mass with a more or less clearly defined centre in which the culture element under consideration is most elaborately, or, better, most typically, developed. Cases of culture distribution of this type are perfectly familiar to American ethnologists. Two or three examples may be given to fix the attention. Agriculture

in aboriginal America is spread over a perfectly continuous territory reaching from the heart of South America, north through Central America and Mexico, into the Pueblo country of Arizona and New Mexico, and east and north throughout the gulf region and Mississippi valley. The centre of distribution is probably to be assigned to the valley of Mexico. The quadrangular wooden house built up on a framework of corner posts and cross beams (with the level of the floor generally lower than the surface of the ground, with inclined roof, often with circular entrance) is a feature reaching from the Tlingit of southern Alaska south to the tribes of northwestern California. The centre of distribution may perhaps be fixed in the coast region of southern British Columbia. The Sun Dance is an elaborate but quite clearly defined ritualistic complex that is found represented among all the typical Plains tribes, but is also shared by a number of adjoining tribes on the east (*e.g.*, Ponca) and on the west (*e.g.*, Ute, Bannock, Flathead). The centre of distribution would seem to be in the heart of the Plains area, say among the Arapaho and Cheyenne.

In these and innumerable other cases the historical reasoning generally employed is easily understood. The cultural phenomenon whose distribution is studied must have originated but once in the area of distribution and have gained its present spread by a gradual process of borrowing from tribe to tribe. In this process the borrowed element is progressively subjected to various associative influences, so that it appears in its least typical form at the periphery of the area, in its most typical or historically oldest form at the cultural centre. This ideally simple mode of interpretation is, of course, seriously disturbed by several important factors. Thus, the spread of the culture element may, for environmental or resistant cultural reasons, be much more rapid in one direction than another, so that the culture centre is far removed from the actual geographical centre of distribution; the cultural centre may even conceivably lie at the periphery, especially if it happens to be near a powerful geographical barrier. Again, the historically oldest form of the culture element or complex may have undergone so much modification or elaboration at the centre as to appear in more typical

form at a considerable distance from it; this factor may lead to the wrong determination of the cultural centre. Movements of population within the area of distribution, furthermore, may bring about an easily misinterpreted type of culture distribution. Yet, in spite of these and other criticisms that may be urged, any or all of which would have to be considered in specific problems, the general value and validity of the theory of culture diffusion as a solution of the problem raised by the continuous distribution of a culture trait must be granted.

Sequence of Diffusion.

For our purpose, that of chronological reconstruction, at least two important principles of method result. In the first place, allowing for such corrections as various cautions make necessary, the tribe at the cultural centre must be inferred to have first developed the culture element or complex studied, while those geographically removed from the centre were later affected by it, those at the periphery receiving the new type of thought or action last of all. Thus, to use our former examples, the Carib and Arawak tribes of South America on the one hand and the Pueblo Indians on the other have probably become agriculturists at a considerably later date than the more advanced peoples of Mexico; such still predominantly but not exclusively agricultural tribes as the Mandan and Iroquois have no doubt taken up agriculture later than the Pueblos; while such outlying tribes as the Southern Paiute and various southern bands of Ojibwa have evidently become desultory agriculturists at a relatively recent time. Again, the quadrangular house of the Hupa and Yurok of northwestern California undoubtedly represents a later period of diffusion, though not necessarily a later type of house, than the more elaborate structures of the Kwakiutl of British Columbia. And the Sun Dance has obviously come later to the Ponca on the one hand and the Ute on the other than to such typical Plains tribes as the Arapaho, Cheyenne, and Kiowa.

Relative Ages of Diffused Culture Elements.

The second mode of chronological inference from the facts of diffusion refers to the relative ages of two culture traits. We may say, roughly speaking, that the larger the territory covered by a culture trait, the older the trait itself. Thus, to return once more to our former examples, agriculture may be suspected to have developed earlier in America than the quadrangular type of wooden house, at least in its more massive form; while both features are certainly older than the Sun Dance complex. A host of other examples will occur to any one. The type of mythological plot known as the "magic flight," which is spread from Asia, through North America, down into South America, certainly possesses a hoarier antiquity than the incident of the diving for mud with which to fashion the earth, a motive which is found in an east and west zone of distribution from the Atlantic seaboard to California and the Columbia valley; the latter, in turn, is certainly an older product of myth invention than, say, the Loon Woman story, which is restricted to a number of tribes in California. The hand game, played with two or four cylindrical bone objects, is distributed over a tremendous area west of the Rockies, reaching from British Columbia south to northern Mexico; it need hardly be insisted that its age is greater than that, for instance, of the special type of stick game played by the northern tribes of the West Coast area. Similarly, the type of geometric designs, executed in twined or coiled basketry, that is found distributed among a vast number of western tribes (from the Tlingit and Chilcotin in the north to the Pima and beyond in the south) must be an immensely older cultural development than the peculiar semi-realistic designs of certain West Coast tribes (Kwakiutl, Bella Coola, Tsimshian, Haida, Tlingit).

Cautions in Use of Criterion of Diffusion.

Delimitation of Culture Concepts. This type of reasoning is often fascinating, it opens up interesting historical vistas, but it also has its peculiar dangers. A difficulty that often arises is the strict definition or delimitation of the culture elements

whose distributions are compared. Properly speaking, no such element originates at a specific point of time, but is imperceptibly connected, by a process of gradual change, with another element or with other elements lying back of it. Thus, a specific type of house or a religious belief or practice is linked historically with other types of house or of religious belief or practice from which it has been modified or by which it has been influenced. Eventually, it is bound to be historically connected with (derived from) a cultural form with which it has little outward resemblance. Hence the logical necessity of delimiting by a specific characteristic or characteristics the particular elements of culture whose relative ages it is determined to ascertain. Such a procedure may seem arbitrary at times, but it is made unavoidable by the futility of the quest for true origins.¹ In comparing the ages of culture complexes (and most cultural "elements" are at last analysis complexes) the complexes themselves must be clearly defined as an assemblage (functionally unified, as a rule) of specific elements. The relative ages of culture complexes do not necessarily throw light on the ages of the elements themselves. Thus, it would be a great mistake to infer from the priority of American agriculture to the Sun Dance complex also a necessary priority of agriculture to such elements of the Sun Dance complex as the ceremonial mock battle, the Sun Dance type of offerings, or the practice of self-torture; nor does the probable priority of the quadrangular wooden house to the Sun Dance complex involve its priority to the type of house which served as model for the Sun Dance lodge. The failure to distinguish between the age of a culture complex and that of one of its elements is largely responsible for much of the unhistorical character of cultural interpretation of the evolutionary type. Many a supposed "survival" is doubtless far older than the typical complex which

¹ This is not the place to develop the thesis that the only conceivable kind of culture origin is the association into a functional unit of cultural elements already in existence in unassociated form. From this point of view any stage in the history of a culture element is fully as much an origin as the reconstructed or hypothetical starting point. Origins, as ordinarily understood, are set off from other points of a cultural sequence merely by more or less arbitrary relative evaluations of such points; to the "origin" is attached greater significance, for whatever reason you please, than to the immediately preceding and following points of the sequence. To use a geographical metaphor, an "origin" is the peak of a time-ridge.

is held to render it intelligible.¹ We cannot go into the question of how culture elements are to be marked off from one another and to what extent culture complexes are artificial abstractions or historically justifiable units. As speculative chronologists seeking to handle definite material, all we insist on is a clear-cut definition of the culture element and the assignment of a definite nucleus of associated traits to the culture complex.

Rate of Diffusion. A second factor in the historical utilization of culture distributions is more difficult to control. This is the vast differences in rate of transmission that must be assumed for (or, to a considerable extent, may be observed in) the various types of culture traits. Thus, it is obvious that a humorous story travels faster than a religious ceremony, a device for trapping game than a system of relationship terms, a social dance than a system of property inheritance, the cultivation of a particular plant than the art of agriculture itself. Hence we cannot directly compare areas of distribution without full allowance for the nature of the distributed traits themselves and, where possible, of the factors involved in the processes of distribution. In other words, such areas must be weighted as well as measured. This weighting presents a difficult but not altogether hopeless problem. The different methods of inferring and comparing rates of culture transmission form a large problem in themselves and cannot be fully outlined here.

I would suggest, with all due reserve, that rate of culture transmission is due to three mutually independent factors or, better, types of factors: the relative ease or readiness with which a culture trait is communicated by one tribe to another, the readiness with which it is adopted by the borrowing tribe, and the external conditions which favour or militate against the adoption of the trait. Where all three groups of factors are favourable towards the spread of the culture element, the rate of such spread is naturally at a maximum.

Conditions of Culture Lending. One of the most important conditions making for readiness of transmission is that a culture

¹ These general considerations on the comparison of culture elements and complexes hold, of course, for the whole of this paper. They are introduced in connexion with the problem of distribution of culture traits because here the matter of definition of such traits is most imperative.

element be not hedged about with secrecy or taboo, that there be nothing esoteric about it. Thus, the spectacular part of a religious ceremony is much more readily borrowed by a neighbouring tribe than the esoteric elements known only to a few. Similarly, a myth or tale which is told for the mere fun of the telling travels faster than an origin or family legend that is owned by a specific society or clan. Again, a medicinal herb or other remedy whose use is widely known and openly practised in one tribe will be readily transmitted to a neighbouring tribe, while a method of treatment that is treasured as a secret by a particular family or religious society¹ tends to oppose itself to cultural transmission. In practice, of course, all cultural elements, no matter of how esoteric a nature, are capable of diffusion. It is a question here merely of relative rates of diffusion.

A still more important, if less easily grasped, condition of ready transmission is this, that the culture element in question be capable of detachment from its context and comprehensible as such. There is no doubt that different culture elements are thus detachable or, what amounts to the same thing, capable of conscious formulation by the native in quite different degrees. We have here a continuous gamut, ranging from the zero, or almost such, of a vocalic or consonantic change to indicate some subtle grammatical notion up to the maximum of what we may awkwardly term "conceptual detachability" of a type of implement of clear-cut form, material, and use. Obviously, culture elements are transmissible, roughly speaking, with an ease that is proportionate to their "conceptual detachability." Thus, we expect a ceremonial dance as such to be much more readily transmitted than any notions there may be as to its function; a myth plot more readily than, let us say, the cosmogonic ideas which serve as its frame; an element of decorative design than the precise mechanical technique in which it is executed or its style of artistic treatment in a particular tribe; a definite social custom, say the mother-in-law taboo, than the exact range of meaning covered by a relationship term.

¹ Thus, the various lines of descent among the Nootka tribes all possess medicines which are guarded with jealous secrecy. Compare with this the secret knowledge of a remedy for rattlesnake bites possessed by the Rattlesnake fraternity of the Hopi Indians.

Conditions of Culture Borrowing. The second group of factors involved in culture transmission, that referring to the receptivity of the borrowing tribe, is probably even more important than the factors already considered. Only one of these factors need be mentioned here—the relative ease with which the borrowed culture element is assimilated to the culture of the borrowing tribe. Almost invariably we find that a new idea or activity borrowed from without falls in line with already existing ideas or activities; it does not so much constitute a new departure in cultural endeavour as fill out with a new richness of detail a pigeon-hole of culture ready to receive it. Frequently enough, in the process of borrowing, its primary significance is either lost or distorted; such loss or distortion is nearly always an expression of the assimilating power of the borrowing culture. In only a vast minority of cases, indeed, is an element of culture transplanted *in toto*, without undergoing assimilatory modifications. As far as the problem of rapidity of transmission is concerned, we are in the main safe in saying that the more perfectly an element fits into its new cultural environment, the more nearly, in other words, it answers to the immediate needs or interests of the borrowers, the more rapid will be the rate of transmission. Hence it is not difficult to understand why myth plots, spectacular dances, games, and certain decorative designs spread with tremendous rapidity and may, in many cases, cover larger areas of distribution than culture elements of greater age. These considerations make it peculiarly hazardous to infer greater age on the basis of geographical distribution when the elements compared belong to widely distinct categories of thought or activity, say social organization and methods of securing game.

External Conditions of Diffusion. The communicability of a culture element and the receptivity of the borrowing tribe, so far as already discussed, are conditioned by the nature of the element itself. External factors of various sorts, however, are generally highly important determinants of the course and rapidity of transmission. These form the third group referred to. Most or all of them may be summarized under the heading of degree of intimacy subsisting between the two tribes involved. Thus, tribes that are on a friendly footing for a long period of

time interchange elements of culture more freely and rapidly than such as are continuously at war with one another. A good example is afforded by the Mississauga, who, though an Algonkin tribe, assimilated in a relatively short time, because of their friendship with the Hurons and, in later times, Iroquois, a greater share of Iroquoian culture than such Algonkin tribes as the Malecite and Abenaki, who were never, at least until quite recently, on friendly terms with the Iroquois. Similarly, the culture of the Athabaskan Hupa is almost identical with that of their friendly non-Athabaskan neighbours, the Yurok and Karok, while that of their Athabaskan neighbours immediately to the south was much less complex.

A particularly important aspect of our problem is the extent to which transmission of culture elements is encouraged by intermarriage. Intermarriage, involving, as it does, change of residence, is perhaps the most potent of the more intimate causes of the spread of a cultural feature. Where, as among certain of the West Coast tribes, the dowry system prevails and where, moreover, as among all these tribes, privileges are inherited by heirs even when identified with an alien tribe, it is evident that many elements of culture (personal names, legends, crests, dances, songs) travel with relatively little change for very considerable distances. Frequently, indeed, we may say more properly that a culture element follows the paths of family connexion than of geographical propinquity as such. Eventually, of course, the cumulative effect of several intermarriages within a given area, aided by the stimulation exercised by an alien culture element on the form of similar activities in the local cultural stock, will make perfectly continuous the distribution within this area of practically any borrowed element.

An important external aid to free cultural transmission is mutual intelligibility (or partial intelligibility) of speech between the tribes that are in cultural contact. Lack of this aid, as we have already seen in the case of the Hupa, Yurok, and Karok, does not by any means constitute an effective bar to the borrowing and spread of ideas and activities, but its presence is certainly a powerful reinforcer of them. It is not surprising, therefore, to find a host of cultural elements held in common by all the

Iroquoian tribes, including the Hurons and Neuters, despite the hostility of these to the League; or to find the various tribes of Nootka Indians, speaking diverse but mutually intelligible dialects, sharing certain ethnological traits in contrast to their Kwakiutl and Salish neighbours. Such a case as that of the Hupa, Yurok, and Karok, or of the Tsimshian and Haida, is, properly speaking, only an apparent exception; for, where contact between tribes of radically distinct speech is close, there will practically always be found a number, sometimes even the majority of one of the tribes, who are bilingual. It is these bilingual individuals who undoubtedly serve, to a large extent, as the media of cultural interinfluences. Generally speaking, then, far-reaching cultural contact can hardly take place except as conditioned by some sort of mutual intelligibility of speech. It is often assumed off-hand that cultural resemblances between linguistically related tribes must go back to a time antedating the present linguistic differentiation. Yet it is evident from what we have said that the very fact of close linguistic affinity paves the way for a more than ordinarily rapid transmission within the geographical bounds of the larger linguistic unit. This in no way contradicts the statement made earlier in the paper that linguistic and cultural areas at least tend to be congruent. It merely points out that such congruence is not altogether necessitated by genetic factors (by a common historical heritage), but may, very largely, be shaped by the secondary process of borrowing under a favouring linguistic condition. This point of view may well cause hesitation in too free a use of the hypothesis of tremendous cultural conservatism in explaining the numerous and often startling resemblances in culture details between various Eskimo tribes. The hoary antiquity of at least some such features, when closely scrutinized, may resolve itself into a relatively recent spread of fashion.

We have already referred to geographical barriers as limiting the even spread of an element of culture. This opens up the question of accessibility of tribe to tribe, of aboriginal waterways and trade routes generally. Clearly, not only articles of trade, such as implements, foods, clothing, and ornament, but all manifestations of culture, whether material or not, travel

easiest along such trade routes. Hence, in evaluating geographical distribution of culture elements for ethnological reconstruction, it makes all the difference whether the tribes observed to have a certain feature in common lie along a well established trade route or not; further, whether or not they are in the habit of meeting periodically, or at least frequently, for exchange of goods and participation in common activities (ceremonies, amusements). Considerations of this sort will sometimes force us to correct radically impressions derived from a mere bird's-eye view of geographical distribution. The distance, for example, between the Copper Eskimo and, say, the Eskimo of the east coast of Labrador is, even in a straight line, more than ten times as great as that which separates the Yurok, of the west coast of California, from the Pomo to the south. Nevertheless, the cultures of the two Eskimo groups mentioned doubtless present many more points of similarity than those of the Yurok and Pomo. Does this prove that the culture traits peculiar to the Eskimo are as a body older than those respectively characteristic of the Yurok and Pomo, or, to put it somewhat differently and perhaps more legitimately, that the Eskimo are, culturally speaking, a much more conservative people than either the Yurok or Pomo? Whether such inferences are correct or not, they do not necessarily follow from the facts of geographical distribution. We must remember that the Eskimo are in the habit of covering immense distances by umiak and sleigh, furthermore that neighbouring Eskimo tribes often meet for trade purposes and that in this way objects and ideas (stories, songs, dances), may, with no great lapse of time, travel far from their home. On the other hand, the Pomo were not marine travelers and, like most central Californian tribes, only desultory river travellers, while the Yurok, though good canoemen, were certainly not in the habit of venturing far out at sea; moreover, inland communication between the Yurok and Pomo would be rendered difficult by the coast range of mountains. In short, the culturally "weighted" distance between the Yurok and Pomo may even turn out to be greater than that between the Copper Eskimo and the remote East Labrador natives. I believe that one of the pressing needs for a study of the larger problems of American culture history is a

careful mapping of the paths along which culture elements can be shown to have travelled with relative rapidity. Other things being equal, a culture element found distributed along lines of rapid transit must be considered as lesser in age than one distributed over the same geographical extent but largely along lines lying aside from trade routes.

Chronological Inferences from Geographical Distribution.

Such considerations as general intimacy subsisting between tribes, intermarriage, linguistic kinship, and means of access constitute some of the external factors governing the rate of cultural diffusion. None of these can be considered as altogether independent of the others, but each may operate in quite different degree. We are now in a better position to make profitable use for chronology of the method of geographical distribution than if we interpret such distribution at its face value. Putting the various factors involved in the transmission of a culture element into the form of a formula, we may say that: a culture element is transmitted with a maximum ease when it is conceptually readily detachable from its cultural setting, is not hedged about in practice by religious or other restraints, is without difficulty assimilable to the borrowing culture, and travels from one tribe to another living in friendly, or at least intimate, relations with it, particularly when these tribes are bound to each other by ties of intermarriage and linguistic affinity and are situated on an important trade route. Geographical arguments as to the age of a culture element transmitted under all these conditions need to be most qualified. General statements, such as have been made by Rivers and others, as to the relative conservatism or ease of diffusion of broad categories of culture, such as religion, mythology, social organization, art, and technology, are of little practical service, as everything depends on the specific nature of the borrowed element, the degree of similarity between the two cultures brought into relation, and the favourable or unfavourable character of the external circumstances of borrowing. While one cannot disprove, for example, that social organization, as maintained by Rivers, is the most conservative of all cultural features, it seems clear to me that the various elements

of social organization may behave quite differently from the point of view of diffusion. A tale, for instance, will normally travel much faster than a type of clan organization, to be sure, but it is perfectly conceivable, on the other hand, that an esoteric ritualistic myth may fail to be borrowed by a neighbouring tribe which has nevertheless adopted isolated features of social organization.

CONVERGENT DEVELOPMENTS WITHIN AREAS OF CONTINUOUS DISTRIBUTION.

So far we have assumed that the geographical distribution of a culture element is continuous and that, this being so, it may be represented as a single historical process of gradual diffusion. But two other possibilities present themselves. A culture trait may be continuous and yet not of single origin; in other words, it may have been independently evolved twice or even more often within its present area of distribution, so that the continuity of distribution represents a meeting and partial amalgamation of two or more distinct but similar streams of influence. Personally I do not believe that such types of diffusion, theoretically possible as they may be, are at all frequent. In probably the majority of supposed cases the two or more contiguous culture distributions are of elements that are of only superficial, not fundamental, similarity; where the similarity is undoubted and where, nevertheless, a single origin seems, for one reason or another, improbable, we are entitled to suspect that there has been an assimilation of two originally more clearly distinct elements into new forms. The criteria, formal and functional, of independent origin (convergence) versus historical relationship of similar cultural elements have been often discussed. The question is a large and puzzling one—puzzling, I venture to think, more in the abstract than as applied to specific cases. In any case, the determination of such independent origin or historical relationship must be assumed as made—how does not directly concern us here—before our methods of chronologic reconstruction can be applied.

INTERRUPTED DISTRIBUTION.

Cautions in Inferring Historical Connexion.

The second possibility is of more interest. A culture element may be not continuous but interrupted in its geographical distribution, that is, it may be found represented in two or more tribes or groups of tribes separated by a tribe or group of tribes which does not share this feature. Here, even more than in the preceding case, it must be clearly ascertained that the supposed similarity in culture is fundamental or real before the problem of independent origin versus historical relationship can be attacked at all. Where the geographical distance is great, the resemblance limited to features of a very general character, and, more important still, the historical trend of the culture element which has been reconstructed for each area proves to run in quite different senses, it would be extremely hazardous, in the absence of other evidence, to infer historical connexion.

Danger of Conceptualizing Too Widely. The constant danger that besets the investigator is to make historical or psychological actualities out of merely conceptual abstractions—the more widely one defines the terms of his abstractions the more easily will he be enabled to embrace very distinct cultural phenomena within a single historical or psychological problem. Superficially the phratic organization of a number of West Coast tribes (Haida, Tlingit, Tsimshian) bears points of resemblance to that of the Iroquois. Between the Iroquois and the West Coast tribes lies a vast stretch of country inhabited almost entirely by tribes without phratic organization. Have we here a case of convergent evolution or of an originally (or from time to time partly) continuous area of phratry distribution which has become disrupted by the vicissitudes of history? A closer study of the nature of the phratries in the two areas soon convinces one that they are in essence more unlike than alike. While the West Coast phratries are, at least in nucleus, enlarged kin groups with specific crests, the Iroquois phratries are rather functional

(quasi-political) aggregations of clans.¹ What I have termed the "historical trend" of the phratries seems different in the two regions. The West Coast phratry, aside from later accretions of originally disconnected clans, seems to have arisen as the result of its splitting up into a large number of clans, that have not altogether lost their sense of kinship. The Iroquois phratry, however, seems to be a secondary confederation of clans.² Thus we conclude that what threatened to be an interesting problem, opening up a wide historical perspective, is hardly more than a conceptualistic mirage.

Degree of Geographical Isolation. At this point I wish to urge that the degree of geographical isolation of the two areas involved must by no means be neglected in weighing the claims of a theory of independent origin against those of historical relationship. The greater the geographical distance, the stronger have we a right to demand the evidence to be of historical connexion, that is, the more rigidly do we apply our criteria. The reason for this is that, as the distance between two tribes possessing a feature in common increases, the greater becomes the difficulty of assuming that all the intervening tribes once also possessed the feature, but lost it, or that the tribes compared

¹ Two or three facts bearing on the complex problem of the nature of the two phratric organizations will suffice here. While, among the West Coast Indians, the phratry as such has its definite crest or crests, the relationship among its clans being largely determined by ownership of this same crest, the Iroquois phratries can hardly be said to be characterized by crests or totemic emblems. On the West Coast the various clans, like those of the Iroquois, are characterized by distinctive sets of personal names; unlike the Iroquois clans, however, a number of clans belonging to the same phratry often possess certain names in common (I have in mind chiefly Mr. C. M. Barbeau's Tsimshian data), a fact that points to the West Coast phratry (or phratric nucleus) as an old kin group that has become subdivided into a number of clans. Both these facts clearly emphasize the kin-group nature of the West Coast phratry as contrasted with the Iroquois phratry. Equally instructive is the ceremonial relation subsisting between the phratries in the two cases. Among the Iroquois the phratries act as such in their relations to each other—in games, in mourning or commemoration ceremonies, in council deliberations. Among the West Coast Indians reciprocal functions, it is true, have been reported for the phratries (witness the phratric burial duties among the Tlingit). but where a more complete analysis has been made (again I have in mind chiefly Mr. Barbeau's Tsimshian data) it would seem that what is really involved in such cases is not the (or an) opposite phratry as such but a group of paternal kinsmen which, in a society with matrilineal inheritance, must needs belong to the (or an) opposite phratry. Here again the West Coast tribes emphasize the phratry as a kin group, the Iroquois as a functional unit.

² There are several reasons for believing this to be true. One of the more important ones is the fact that while the clans correspond to a large extent in the Iroquoian tribes, their grouping into phratries does not. In other words, the Iroquoian clan tradition seems older, on the whole, than the phratric tradition.

were once in geographical contact but were later severed by migration. Neither of these alternatives is at all impossible, though the former has undoubtedly been more often theoretically advanced than specifically demonstrated. The point to remember is that the probability of either decreases, other things being equal, with the increase of distance. The claim of Graebner and others of his school that the test of historical relationship between two culture elements is to be sought solely in certain formal and other characteristics of the elements themselves without any regard to the geographical difficulties involved must be rejected as naïve. It tacitly assumes that we are able in every given case to decide whether a culture feature or group of features is or is not capable of more than one independent origin, that is, it affects to treat as mathematical certainties judgments which notoriously vary from individual to individual. Where there is in practice so much room for difference of interpretation of Graebner's criteria, we shall do well to cling humbly to the geographical caution. Hence, *e.g.*, a West Coast crutch paddle will not necessarily be heard to cry vigorously for its Melanesian mate.

Chronological Value of Interrupted Cultural Distribution.

A considerable number of valid cases, however, of historical relationship between culture elements found in geographically non-contiguous areas undoubtedly remains. How this validity is to be established it is not part of our task to define. Before similarity of geographically disconnected culture elements can be utilized for chronological purposes, it is obvious that their historical relationship must be assumed as demonstrated.¹ Such historical connexion, as already indicated, can be under-

¹ This does not mean that arguments based on time perspectives gained from a consideration of other data may not help to establish the independent origin or historical relationship of the similar culture elements investigated. Thus, to use our former example, if it could be shown on other evidence that the Iroquois phratries have necessarily originated subsequently to the rise of a culture element whose distribution is confined to the Eastern Woodlands tribes and whose former existence cannot be demonstrated among the West Coast or intervening tribes, it becomes increasingly difficult, impossible indeed, to historically connect the phratries of the two regions. On the other hand, if it could be shown on other evidence that the Iroquois phratries necessarily antedate the rise of a culture element of almost universal distribution in America, say the acquiring of power from manitous, the ground would be effectively cleared for the demonstration of the thesis that the phratries of the two regions are historically connected.

stood in two ways. We may either succeed in showing that the intervening tribes, who once possessed the culture element, have lost it; or we may show that one or more of the tribes of one of the areas formerly lived in geographical contact with the tribes of the other area and was, at a subsequent period, severed from them either by a peaceful migration or by the irruption of hostile tribes. In either case the problem is reduced to the normal one of the continuous diffusion of a culture element from a single centre.

For chronological purposes, cases of the interrupted distribution of a culture element are of particular importance. In a general way, a culture element whose area of distribution is a broken one must be considered as of older date, other things being equal, than a culture element diffused over an equivalent but continuous area. The reason for this is that in the former case we have to add to the lapse of time allowed for the diffusion of the element over its area of distribution the time taken to bring about the present isolation of the two areas, a time which may vary from a few years or a generation to a number of centuries. Thus, any culture traits which, *e.g.*, the Tuscarora may be shown to have in common with the non-contiguous tribes of the Iroquois League alone may well be suspected to be of greater antiquity than such as say the Neuters or Erie may be shown to share with the neighbouring League tribes alone.

More specifically, the interrupted distribution of a culture element gives us a minimum relative date for the origin of the culture element itself. The element must have arisen prior to the event or series of events that resulted in the geographical isolation of the two areas. Examples of this type of chronological reasoning will occur to every one; they are particularly easy to understand where there has been a tribal migration. Thus, the peculiar type of star myth (identification of mythological heroes with stars or constellations) found among both the Arikara of North Dakota and the Pawnee of Nebraska, but not among the intervening Siouan tribes, was doubtless developed before the northward drift of the Arikara away from their linguistic kinsmen. In a similar way, we may conclude that the family hunting territories, with tendency to paternal descent, of the Algonkin

tribes of New England and the Maritime Provinces (Penobscot, Abenaki, Micmac), a feature found also among the Algonkin tribes of the Ottawa valley (Ojibwa, Algonquin) but not, as far as can be ascertained, among the intervening Iroquoian peoples, go back to a time preceding the irruption of the latter into what must formerly have been Algonkin territory.

More difficult of treatment are cases of interrupted distribution not due to movements of population. In only a small minority of these will the culture element in question turn out to have totally disappeared without trace in the intervening region. It is, indeed, almost inconceivable that the formerly existing cultural feature should have been so thoroughly wiped out or should have been so completely replaced by another element of equivalent function as to leave no trace. Generally we shall find that it either lingers on in modified form or that other cultural features (say mythological references) presuppose it. The more profoundly the element has become modified in the intervening region or the less evident traces it has left of its former existence, the older must we infer its formerly continuous distribution and its origin to be.¹ According to whether one emphasizes differences or similarities in analysing culture elements and complexes, the same problem may often be labelled one of either interrupted or continuous distribution. One application of the chronological thesis based on interrupted distribution will suffice here. The conical bark lodge with pole foundation is found distributed among many Algonkin tribes in Maine and Canada, also farther west among Athabaskan tribes. Among the Paiutes of the southern plateaus we find it again, except that instead of regular layers of birch bark we have cedar bark more

¹ There is nothing to prevent our inferring its original centre of distribution to have been in the intervening territory itself in which the element is no longer found in characteristic form, if at all. Thus, Buddhism in Ceylon and in Tibet point, aside from such overwhelmingly corroborative documentary evidence as we possess, to its formerly continuous distribution via India, where, despite its lingering existence among Jain sectaries, it may be said to have disappeared as such. Now, we know that Buddhism arose neither in Ceylon nor in Tibet, but in India, whence it was diffused north, south, and east. Quite aside again from older documentary evidence, we could have inferred that Buddhism was diffused from India because several features connected with it point to Indian culture (*e.g.*, Buddhistic terms current in Tibet and elsewhere which are evidently of Sanskrit origin; certain philosophic ideas, such as continuous reincarnation and delivery from earthly existence attained by those of extraordinary religious merit, that are characteristic of Indian religion in general).

loosely applied as a covering to the framework. Between the areas occupied by these two types of conical bark lodge are intruded the conical mat lodge (Interior Salish, Nez Percé) of the plateau and the buffalo-skin tipi of the plains. Obviously the mat and skin tipis are best considered as modifications of an older type of bark lodge. The point that chiefly interests us here is that the conical bark lodge must be assigned an age great enough to allow for the origin and development of its derivative forms. The older we deem the skin tipi to be, the greater the age we shall have to assign to the conical bark lodge itself. The comparison, with a view to determination of age, of culture elements with interrupted distributions among themselves and with such as have continuous distributions is naturally subject to all the cautions we have reviewed in dealing with continuously diffused elements.

DIFFUSION VERSUS COMMON HERITAGE.

A contrast is often made between identity or similarity of culture due to diffusion and to independent retention of a common heritage. The alternative is, however, one of degree rather than of kind. Any culture element is practically certain to be diffused over more than a single community, indeed its currency in a single community is already an instance of diffusion that has radiated out, at last analysis, from a single individual. When, for one reason or another, the continuous area of distribution is broken up into two or more isolated ones, the element in question will normally continue to be diffused among the new neighbours of one or more of the geographically detached groups. Hence at no point in the history of the culture element has its gradual diffusion ceased. All that we mean when we say that two non-contiguous tribes have independently inherited a culture element is that its former diffusion among them antedated the events that brought about their isolation, not, as is sometimes loosely assumed, that there is no problem of diffusion involved as far as they are concerned. For us this raises no new problems. It is simply a matter of estimating the age of one historical process in terms of another.

Culture Areas and Strata.

THE CONCEPT OF CULTURE AREA FROM AN HISTORICAL STAND-POINT.

It is customary to group the tribes of North and South America, as of other parts of the globe, into a relatively small number of culture areas, that is, groups of geographically contiguous tribes that exhibit so many cultural traits in common as to contrast with other such groups. Despite the undoubted conveniences of this mode of classification, we should be under no illusions as to its character. The culture area is primarily a descriptive, not an historical, concept. The various culture elements that serve to define it are of very different ages and their grouping into a set of cultural differentia is applicable only to a particular, in our case generally a very recent, cross-section of history. This means that the different culture areas recognized in North America, say, are historically not necessarily comparable at all. If for instance, it could be shown, as seems not unlikely, that all or most of the cultural differentia constituting the Plains culture area arose at times subsequent to the development of most of the features characterizing the Eskimo and Eastern Woodland culture areas, we should be compelled to conclude that, from an historical standpoint, the Plains area is a sub-grouping of some kind when contrasted with the relatively primary groupings of the Eskimo and Eastern Woodland areas. Such a result necessarily follows from the quite different historical weightings given, let us say, to the skin tipi, buffalo hunting, the rawhide industry, the camp circle, and the Sun Dance, on the one hand, and to the kayak, the conical bark lodge, the two-pronged fish-spear, beaver hunting, the birch-bark industry, and "medicine" conjuring on the other.

As for the earlier cultural status of the tribes that constitute our "sub-grouping," two possibilities present themselves. We may find that the elimination of those historically secondary cultural elements that were responsible for the interpretation of the sub-grouping as a distinctive culture area either leaves the area possessed of primarily such features as are shared also by a single neighbouring culture area; or, on the contrary, discloses

descriptively secondary (historically primary) lines of culture cleavage within the area, so that it breaks up into two or more sections that respectively belong to neighbouring culture areas. In the former case we may speak of a specialized cultural development originating within a larger culture area. Many, or at least some, of the features which at first seemed to constitute exclusive differentia will in this case prove to be merely specialized forms of elements whose presence may be demonstrated in the primary culture area. In the latter case, a number of superimposed cultural features, diffused over a continuous area, have proven strong enough to create a new culture area which breaks up and unites older ones.¹ It is not always easy in dealing with specific problems to determine whether a (secondary) culture area is the result of specialized development within a larger culture area or represents a "reassortment" of culture areas. Taking the Plains culture area, for example, we may either think of it as a specialized form of culture based on a more general Eastern Woodland culture; or we may prefer to see in it a culture blend in which participate tribes originally belonging to the Eastern Woodland, the Southeastern, the Plateau, and possibly the Southwestern culture areas. The latter view seems more tenable to me, though particular emphasis should, I believe, be placed on the historical relation between the Plains and Eastern Woodland areas.

The synthetic process by elimination that we have roughly indicated is, of course, a successive one. An historical analysis of North American culture would quite probably reduce the present culture areas to two or three fundamental ones, say a Mexican culture area, a Northwest Coast area, and a large Central area of which the Pueblo and Eskimo areas are the most specialized developments; the former as conditioned by profound Mexican influences, the latter as conditioned by a very peculiar environment. Whether or not the particular results here indicated prove correct, the method of chronologically weighting culture areas, or rather cultural differentia constituting

¹ This process of "reassortment" of culture areas is taking place on a large scale to-day. Such modern features as the factory system, the organization of labour, steel armament, railways and numerous other technical advances, and the parliamentary form of government are simultaneously creating new geographical units of culture and breaking up old ones.

such areas, is now more or less clear. These areas are not strictly comparable on a flat, but may represent quite distinct historic levels. The process of elimination is, as a matter of method, equivalent to the removal of an archæological stratum so as to enable us to penetrate to the culture lying disclosed just below.

THE CONCEPT OF CULTURE STRATUM AND ITS HISTORICAL DIFFICULTIES.

We are now face to face with the concept of a culture stratum. In the case of our own modern occidental civilization we distinctly feel that certain elements and complexes belong to a stratum that centres about the tremendous industrial advance characteristic of the nineteenth century, others to another stratum underlying this which is closely associated with the spread of Christianity, still others to a stratum of custom and belief which antedates the advent of Christianity. At first sight the concept of a culture stratum, that is, of a group of culture elements which go back in origin to a common period, differs from the concepts of a culture area and of a culture complex in that it is strictly chronological in character, whereas the latter are respectively culture-geographical and conceptual in nature. In actual practice, however—and here lies its weakness for chronological purposes—it is not possible to disentangle the culture stratum altogether from conceptual and geographical considerations.

As to the conceptual difficulty, consider for a moment the various vicissitudes that some element bound up with Christianity has undergone in the course of its history. Would such an element of modern English culture, for instance, as the inclusion of the Archbishop of Canterbury in the House of Lords have to be considered as belonging to a specifically Christian culture stratum or not? Much depends on the particular aspect of this institution that we choose to emphasize. If we treat it primarily as an anachronism in modern society, as a vestige symptomatic of a former status in England of church prerogative, we might well assign it to a Christian culture stratum, a stratum one of the ruling ideas of which was the supreme importance in daily

life of a correct attitude towards certain religious dogmas and of the necessity of controlling such an attitude by means of a hierarchy of office. On the other hand, we may lay the emphasis rather on the parliamentary aspect, considering the Archbishop's seat as an element in the development of a parliamentary form of government. This development, however, is to be assigned to a culture stratum which is, in the main, subsequent to the Christian stratum. In this particular case we have a wealth of documentary evidence which enables us to analyse the institution into its various elements and to assign each of them to its proper chronological place. In the absence of such evidence, however, even the application of several of the criteria reviewed earlier in this paper might not throw enough light on the remoter history of the institution to prevent a certain blurring of perspective, with consequent more or less arbitrary assignment of the whole complex to a definite culture stratum in which it is grouped with conceptually associated complexes. The tendency, therefore, to lump culture elements and complexes that are pervaded by some central idea together as belonging to one culture stratum is strong and is seldom resisted by those who undertake to define such strata.

The geographical bias also may be elucidated by an example taken from our own culture. At the very time that the emphasis on industrial development was greatest there was plainly perceptible a stream of Oriental influence on art, literature, and philosophy (we have only to think, for instance, of the vogue of Chinese and Japanese porcelains and of Japanese prints and kimonos, of the direct influence exerted on our own painting and drawing by Japanese models, of Fitzgerald's Omar Khayyam, of the Vedantist societies that flourish in certain circles). To put it in terms of daily experience, the man who has just bought himself an automobile is likely to have also invested in a Japanese vase for the adornment of his parlor. Living in the present as we do, we feel keenly that the invention and use of the automobile and the popularity of Japanese vases are, as far as we are concerned, cultural elements of the same stratum, both first appearing in our culture at about the same period. Yet it is hardly likely that a culture-historian of the distant future, un-

possessed of documentary evidence, would ascribe their appearance in our culture to the same time. It is more likely that he would class the automobile with the steamboat, railway, telegraph, telephone, and other inventions as having arisen in a certain period (call it the Age of Industrialism). The culture stratum going back to this period (and he might be able to demonstrate that the strike, woman suffrage, and the Montessori method of education, among other elements, belong to the same stratum) he would probably succeed in diagnosing as being, on the whole, of indigenous origin. The Oriental influences we have spoken of (and let us even grant that he can show them to be largely contemporaneous in origin and to be quite distinct historically from the older stream of Oriental influence represented by the introduction of rice and tea) will impress him as constituting or belonging to a different stratum of exotic origin. There are likely to be but few, if any, indications of an associational character pointing to the fact that the indigenous elements are to be ascribed to the time when the later Oriental influences were coming in. If he succeeds in demonstrating, as he is quite likely to, that in China and Japan the porcelain vase, the silk kimono, and the peculiarly Japanese art of delineation are very much older than the automobile and associated elements, he would be strongly tempted to conclude that the "Industrial" culture stratum is of later origin than the stratum associated with Oriental art also in occidental culture. And yet, as we happen to know, this would be doing very serious violence to the facts of history. In short, there will be the same tendency to unify and isolate as a culture stratum elements of demonstrably the same geographical provenience as to unify and isolate as a culture stratum elements of the same conceptual group.

The concept, then, of a culture stratum, as actually handled in the study of primitive culture, can hardly lay claim to being a clean-cut historical implement. It may be defined as a group of associated culture elements and complexes which in origin, if not always in their actual form as recorded, go back to the same general period, but which is apt to include elements of quite different date but related content and to exclude elements of like date but distinct geographical provenience. It is an his-

torical concept in theory, in practice strongly biased by psychological and geographical considerations. What makes it possible for the ethnologist to speak of culture strata at all as of more than purely local application is the fact that many characteristic elements are so widely diffused that they are found grouped together within certain geographical limits. Thus, in the Plains area the camp circle and Sun Dance are correlated throughout the greater part of their area of distribution, not so much because they are an organically connected pair of elements as because, being, roughly speaking, of like provenience and age, they are distributed in largely parallel fashion. The different factors responsible for differences of rate of diffusion make themselves felt, however, at the rims of the distribution areas of these two elements, a point which shows conclusively that there can be no talk of organic connexion. Thus, the Sun Dance is found among the Utes and Bannocks to the west, who do not use the camp circle; the Sun Dance is absent among the Omaha to the east, who group their clans, when on the hunt, in the form of a camp circle; while the Nez Percé to the west, who have borrowed a number of Plains features (*e.g.*, the skin tipi and the rawhide parfleche) possess neither the Sun Dance nor camp circle. If two of the most characteristic features of Plains culture thus present what we might call a "ragged edge" of distribution, it is evident that the totality of such traits presents a far greater "raggedness of edge"; the distribution rim of some will fall well within the bounds of the typical Plains area, that of others will extend far beyond the bounds of this area into adjoining or distant culture areas. We are forced to conclude, then, that a culture stratum, unless it be to all intents and purposes identified with a coherent culture complex, cannot travel very far from its area of distribution without losing many or finally all of its characteristic elements. The notion of a culture stratum, composed of a large number of elements that are technically independent of each other, journeying without great loss of content, as though isolated in a hermetically sealed bottle, from one end of the world to the other is unthinkable and contradicts all historical experience. The phrase "kulturgeschichtliches Nonsens" might well be applied to such a Graebnerian

conception of culture transmission, though its sponsor would fain have us think that it is the opposed notion that deserves it.¹

LIMITATIONS TO THE HISTORICAL USEFULNESS OF THE CONCEPTS
OF CULTURE AREA AND STRATUM.

Our rapid review of the concepts of culture area and culture stratum may seem rather disappointing, but it should be remembered that our point of view is entirely historical, not descriptive or psychological. The culture area is a highly useful classificatory device for descriptive purposes, indeed it aids considerably also in the psychological interpretation of culture; its usefulness for historical purposes, however, depends entirely on the extent to which its differentia can be interpreted as a culture stratum or a series of culture strata. The culture stratum itself is an intrinsically useful historical concept but, owing to reasons already advanced, it may be both unduly inclusive and exclusive; hence the erection of a sequence of culture strata, when unsupported by archæological evidence, must not be interpreted too rigidly but must allow for very extensive overlapping. And, most important of all, the culture stratum must not be freely handled as a universal counter, but needs to be restricted to the bounds set by at most a continent or parts of two adjacent continents. Some strata, indeed, must be considered as of hardly more than local application. As far as American culture is concerned, I think it would be more than advisable for the present to refrain from the attempt to establish a sequence of strata intended to hold for the whole of North and South America; further, to refrain from assigning such generalized elements as the crutch paddle, the simple bow, the exogamic clan, or the manitou concept to specific culture strata. A painstaking determination of the relative ages and directions of distribution of the single culture elements and complexes themselves must eventually yield a solid basis for their grouping into strata and for the extent and direction of distribution of these strata.

¹ Father Schmidt's demonstration of the existence in South America of identically the same culture strata as Graebner had isolated in the South Seas is a welcome *reductio ad absurdum* of the latter's conception of culture diffusion.

The main burden of affording us the historical depth that we seek to find in primitive culture must always be borne, I believe, by the analysis of the culture elements and complexes rather than by the culture strata that we build out of them. However, the determination of sequences of strata and of synchronous or chronologically parallel culture areas helps greatly in giving us a larger historical perspective. The greater the number of successive culture strata we are able to unravel, the more distant our vision into the past. The greater the number of culture areas whose differentia reach back to an equally remote past, the greater age can we claim for the fundamental culture that includes the cultures of such areas.¹

Thus, it makes a great difference in historical perspective whether our recognized North American culture areas as such can be shown to be of approximately equal age or to loosen up, as it were, into a smaller number that lie back of them, as previously suggested. In the former case we must allow for a far greater lapse of time for the formation of present-day culture areas than in the latter. A further value of the employment of culture areas and strata lies in the readiness with which we may by means of them handle groups of descriptive facts without the irksome necessity of particularizing in every case. The economic value of such labels as "Plains culture area" and "Plains culture stratum" (or, in Graebnerian parlance, "camp-circle culture stratum") is by no means to be underrated, even by those to whom they seem of only secondary historical value.

EVIDENCE OF LINGUISTICS.

LANGUAGE AND CULTURE.

We have, finally, to consider the manner in which linguistic data may be employed to set culture elements in chronologic relation to one another. There are two basic factors which make it possible for linguistic evidence to serve such a purpose. In the first place, a language is not a disconnected complex apart from culture but, on the contrary, is an important part of

¹ A culture, I hasten to add, that need by no manner of means be assigned to America itself.

the culture of a particular people living at a definite time and place. As such it reflects in its subject matter, *i.e.*, chiefly vocabulary, many of the non-linguistic elements of that culture. Its association with a definite tribe or group of tribes often enables us to make valuable inferences as to earlier distributions and movements of population, while its mirroring of culture is obviously of great assistance in the securing of a perspective for the culture itself. In the second place, language, like culture, is a composite of elements of very different age, some of its features reaching back into the mists of an impenetrable past, others being the product of a development or need of yesterday. If now we succeed in putting the changing face of culture into relation with the changing face of language, we shall have obtained a measure, vague or precise according to specific circumstances, of the relative ages of the culture elements. In this way language gives us a sort of stratified matrix to work in for the purpose of unravelling culture sequences; its relation to culture history may be roughly compared—one should not press the analogy—to that of geology to palæontology. How linguistic perspective is obtained, how linguistic features or elements are assigned to a relatively late or early period, how they may be reconstructed to earlier forms we can not undertake to demonstrate here,¹ as these problems are far beyond the scope of the present paper. We must here assume these results as possible of achievement and limit ourselves to a consideration of how they are to be utilized for cultural reconstruction.

In three important respects language, as an instrument for reconstructing the past, has the advantage of culture. First of all, it forms a far more compact and inherently unified conceptual and formal complex than the totality of culture. This is due primarily to the fact that its function is far more limited in nature,² to some extent also to the fact that the disturbing force of rationalization that constantly shapes and distorts culture anew is largely absent in language. Any changes, then, that affect language are generally more consistently and regularly

¹ The general subject of time perspective in language, specifically in American languages, I hope some day to take up in a separate paper.

² The greater the specialization of function, the more neatly are the parts of a complex apt to be bound together and the finer the technique.

carried out than in culture; this means that there are, on the whole, fewer cautions to observe in the application of such chronological criteria as can be formulated. Secondly, linguistic changes proceed more slowly and, what is more important, at a generally more even rate than cultural ones. This means that, particularly where there is abundant comparative linguistic material available, we are enabled to penetrate farther back into the past and to obtain a more reliable feeling of relative durations of such linguistic time sequences as are available. Thirdly, and most important of all, a language is, of all historical products, at the same time the most perfectly self-contained and the least often apt to enter as such into the central field of consciousness. Its resourcefulness in meeting with, in other words adequately reflecting, new conditions is extreme, so that violent cultural changes are often accompanied by only moderate linguistic adjustments.¹ From all this it follows that a language, under normal circumstances, is relatively little affected by influences from without. Whereas in culture curiously little remains when the manifold streams of foreign influence have been eliminated, the elimination from a language of such linguistic features, whether as regards form or content, as are due to outside influences, nearly always leaves all but the whole of the formal framework and by far the greater part of its content standing intact as of native growth. That this greatly simplifies the chronologic problem is obvious. Moreover, where there has been foreign influence, it is very much easier to recognize it as such and see it in proper relief against the native ground-work than in the case of culture. Indeed, this very sharpness of contrast between the native and the foreign elements, a sharpness which naturally tends to become obliterated with age, is frequently helpful in the making of chronological inferences. However, we must be clear that the methodological advantages enjoyed by linguistics in inferred chronology are of direct benefit only to linguistics itself; they become of use also to culture only indirectly, that is, insofar as such advantages affect linguistic features that are closely associated with cultural considerations.

¹ Thus, it is amazing how little such languages as Iroquois or Chinese have been affected in their essentials by sweeping cultural changes in modern times. And yet they succeed perfectly in giving expression to all new needs in terms of traditional form and subject matter.

There are chiefly two ways in which linguistic data may yield results of chronologic interest to the history of culture. We may either take a single linguistic element (word, grammatical element, morphological peculiarity, phonetic characteristic) and study its cultural associations and geographical distribution; or we may take a language or linguistic group as such and work out its geographical distribution and, in most cases, differentiation into smaller units with a view to deducing from this certain historical facts. The method of association of culture elements corresponds to one aspect of the former of these linguistic problems, the method of distribution of culture elements to another aspect thereof and to the second linguistic problem. Roughly speaking, linguistic elements correspond to culture elements and complexes, linguistic groups to culture areas.

INFERENCES FROM ANALYSIS OF WORDS AND GRAMMATICAL ELEMENTS.

Descriptive and Non-descriptive Terms.

ANALYSIS OF CULTURE WORDS.

If we have any method of determining the relative age of a word¹ that has cultural significance, it is clear that we have at the same time a means of ascertaining something as to the relative age of the associated culture element itself. One of the most useful principles for the determination of the age of a word is a consideration of its form; that is, whether it can be analysed into simpler elements, its significance being made up of the sum of these, or is a simple irreducible term. In the former case we suspect, generally speaking, a secondary or relatively late formation, in the latter considerable antiquity. We assume here, of course, that we are able to eliminate borrowed words, which,

¹ In applying linguistic data to culture-historical uses in many Asiatic and European languages we are, of course, immensely aided by documentary evidence, inasmuch as the changing form and content of language are more or less adequately reflected in datable records. For aboriginal America, however, documentary linguistic evidence, while not altogether wanting, is relatively scanty. The methodology of linguistic reconstruction is, therefore, bound to restrict itself in the main to inferential evidence. Such evidence alone, indeed, is here considered.

however recently introduced, are naturally incapable of analysis from the point of view of the borrowing language.¹ We know, for instance, that the objects and offices denoted in English by the words *bow*, *arrow*, *spear*, *wheel*, *plough*, *king*, and *knight*, belong to a far more remote past than those indicated by such words as *railroad*, *insulator*, *battleship*, *submarine*, *percolator*, *capitalist*, and *attorney-general*, but we might have guessed this from the fact that the latter set, unlike the former, are clearly secondary formations, descriptive terms that seem to have been created out of older linguistic material to meet new cultural needs. This type of reasoning does not by any means imply that the older stock of non-descriptive words are necessarily in origin of a category distinct from the later descriptive ones. As a matter of fact, comparative, direct historical, or other evidence frequently enables us to show that what now appear to be non-descriptive terms are themselves originally descriptive in character, but, through the destructive agency of gradual phonetic change, have in time lost their morphological transparency.² It is this very obscuring, in course of time, of the analysis of a word, that gives the contrast between words of evident morphology and unanalysable words its chronological significance.

In aboriginal America there are undoubtedly countless examples that might be chosen of the operation of this method of inferring the relative ages of culture concepts, but linguistic data have as yet been so little employed by Americanists in the handling of ethnological problems³ that we need not be surprised to find them only sparsely, if at all, represented in the literature. An example or two will, therefore, be of service. The Tsimshian word for crest, *dzabk*, offers a contrast, from the point of view of morphologic analysis, to that for phratry, *ptε·x*. While the latter is, so far as we can see at present, a morphologically irreducible

¹ Thus, such a Wishram word as *it-stagin* "stockings" is incapable of Wishram analysis, but is naturally merely a recent loanword from English *stocking*.

² Thus, the word *king* (Anglo-Saxon *cyning*) can be shown to be a derivative of *kin* (Anglo-Saxon *cynn*); its significance at an earlier stage of its history was thus "one who belongs to (represents, leads) a kin-group." This example shows incidentally that linguistic analysis often helps to unravel the earlier history of a culture concept.

³ Aside from the use of the concept of linguistic stock, particularly as expressed in Powell's linguistic map of aboriginal America north of Mexico. Many ethnologists, indeed, have gone much further in the definitive and exclusive use of these stock groupings than the historical-minded linguist would concede as allowable.

term, the word *dzabk* is clearly a derivative of the verb *dzab* "to make," *-k* being a mediopassive suffix; *dzab-k* may thus be interpreted as "what is made" or "what is represented in visible form," referring probably to the carvings and other plastic representations of crests.¹ These linguistic facts may be deemed much too slender to justify the inference that the present phratric groupings, or better phratric groupings of some kind, antedated the development of clan and phratric emblems, though I should not be inclined to consider as improbable the fact of the inference. However, it seems that one may at least conclude that the extensive representation of the crest belongs to a later period of the history of Tsimshian social organization than the origin of phratry groupings. The present argument is corroborated by another linguistic criterion, that of the geographic distribution of a word, of which more anon. In the Nass River dialect, which is rather closely related to Tsimshian proper, the word for phratry, *ptε·q'*, is only dialectically different from the corresponding Tsimshian word, while an entirely different word, *'ayuk^us*, is used to denote a crest.

This type of argument is frequently an alluring one when it is a question of comparing the relative antiquity of the same culture concept in two or more distinct tribes. Thus, the Nootka have a word for attendant at a feast, *yatsmi·ł̄hsi*, which can be readily analysed as "one-who (*-ł̄hsi*) walks (*yats-*) about-in-the-house (*-mi·ł̄-*)," whereas the corresponding Kwakiutl word, *'alk^u*, is not capable of analysis. It hardly seems too far-fetched to surmise from this that the ceremonial aspect of feasting was earlier developed among the Kwakiutl than among the Nootka.

ANALYSIS OF PLACE NAMES.

The analysis of place names is frequently a valuable means of ascertaining whether a people have been long settled in a particular region or not. The longer a country has been occupied, the more do the names of its topographical features and

¹ Similarly, the Kwakiutl word for crest, *k̄e's'o'*, is doubtless a derivative of *k̄e'ń'* "to carve." According to Mr. Barbeau, the Tsimshian are quite aware of the relation of *dzabk* to the verb *dzab*, though another interpretation is sometimes offered. According to some, a *dzabk* is "what is made up, devised" and shown at a potlatch, referring rather to the invention of new ways of showing old crests or even the invention of new crests

villages tend to become purely conventional and to lose what descriptive meaning they originally possessed.¹

Thus, it is by no means an accident that a considerable number of village names among the Nootka are incapable of satisfactory analysis, whereas the names of topographical features among such less settled tribes as the Paiute and Ojibwa are in practically every case readily interpreted. It is sometimes instructive to compare the names for the same topographical feature among two or more tribes. Mt. Shasta, in northern California, is visible to a considerable number of distinct tribes. The Hupa call it *nin-nis-'an lak-gai*, a descriptive term meaning "white mountain"; while the Yana have a distinctive term for it, *wa'galu'*, which does not yield to analysis.² We may infer from this that the Hupa, as an Athabaskan-speaking tribe, are newcomers in northern California as compared with the Yana, a conclusion that is certainly corroborated by other evidence.

CAUTIONS IN USE OF METHOD.

Danger in Comparison of Equivalent Words in Different Languages.

In actual practice, however, it is apt to be dangerous to use the method we have considered when dealing with words for the same culture concept in different tribes. The chief reason for caution lies in the great differences exhibited by different languages in the relative freedom with which descriptive terms are formed. Some languages, such as Chinook and Takelma, have a relatively large number of radical elements and hence are not as apt to resort to descriptive formations as are languages, say Athabaskan, that have a smaller number of radical elements but greater powers of synthetic word-formation. Moreover,

¹ Note, *e.g.*, the more or less transparent analysis of such names of cities in America as New York, Philadelphia, Washington, New Orleans, Indianapolis, St. Louis, San Francisco, Buffalo, as contrasted with such at present meaningless European names as London, Paris, York, Leeds, Rouen, Rheims, Rome, Naples.

² *wa-* may be identical with Yana *wa-* "to sit." Of how long standing the term *wa'galu'* must have been among the Yana is further evidenced by the fact that its diminutive, *wa'ganu'pa* "little-Mt. Shasta," is applied to Mt. Lassen, a volcanic peak within the confines of their own territory. Mt. Shasta is in neither Hupa nor Yana territory.

the rates of phonetic change undoubtedly differ very considerably in different languages, so that obscuration of an originally descriptive term may be brought about more readily in one than in another. How long a descriptive term for a culture concept of undoubted antiquity may linger on in a language which tends to keep its analysis of descriptive terms transparent is illustrated by the Athabaskan word for glove or mitten. Among the Athabaskan tribes of the Mackenzie valley we can hardly doubt that the mitten was an old element of their material culture; hence we would rather expect the term for mitten to be a non-descriptive term than a compound yielding readily to analysis. As a matter of fact these tribes use a word which simply means "hand-bag" (Chipewyan *la-djis*, Hare *lla-dji*, Loucheux *nle-djic*). We may put up with this when we recollect that Athabaskan shows a more than ordinary fondness for synthesis, but we are certainly given a jolt when we find that exactly the same transparent compound turns up in Navaho as the term for mitten (*la-djic*).

Changes in Terminology.

Even when the method is in the main restricted to a comparison of culture words in the same language, a number of cautions are necessary. In the first place, a culture concept may prove to be old in spite of the fact that its designation is demonstrably of recent origin, for the older, perhaps non-descriptive, term may have become obsolete and given way to a later formation. One of the most potent sources of such changes in terminology is the widespread custom of tabooing words for a certain period after the death of a person whose name was identical with, compounded of, or even merely similar to such words. Normally the old word is reinstated after the taboo is lifted, but it must often have happened that the newer, generally descriptive, term lingered on out of habit alongside the older one and eventually even replaced it altogether. That the present term for an old culture concept is not necessarily the primary one in the particular tribe studied is demonstrated by the analogy of many evidently secondary terms for non-cultural concepts which must have been familiar to the natives from time immemorial. Thus,

the crane must have been uninterruptedly known to the Hupa as far back as the time at which the hypothetical undifferentiated Athabaskan prototype of Hupa was spoken in the far north. Nevertheless, we find that the Hupa do not use the regular Athabaskan stem *deł* for crane, but a descriptive term (*xas-lin tau*) meaning "he who frequents riffles." Very likely the old non-descriptive word for crane became obsolete because a name taboo enforced its temporary disuse. In general, then, it is safest to use the morphological criterion for the age of a culture word when comparative linguistic evidence does not show that it was preceded in use by a non-descriptive term of like meaning.

Changes in Application of Culture Words.

There is, further, a reverse caution to be observed. The culture word may be of undoubtedly great antiquity but, owing to a change of meaning that it has undergone, the culture concept that it at present symbolizes need not, at least in its present form, be as old as the word itself. Thus, it goes without saying that the English word *needle*, which can be traced back to a very remote antiquity, did not always denote the delicately fashioned article of steel that we now know, but was originally applied to a more primitive prototype of bone and, later, of bronze. Still more striking is the history of our English word *Hell* which, in spite of its present characteristic significance, originally referred to a cold and cheerless domain presided over by a female deity. A striking instance of this sort from aboriginal America will further illustrate the necessity of caution. The Athabaskan non-descriptive noun stem *łleł* is found in both Chasta Costa and Navaho with exactly the same meaning, "matches." It is perfectly obvious from other considerations that this can not possibly be the primary meaning of the word and we learn, indeed, by comparison with other Athabaskan dialects (*e.g.*, Chipewyan) that *łleł* properly means "fire-drill" and was transferred to "matches" when these came in as a modern substitute for the former. I mention this example not because there is the slightest actual danger here of misinterpreting the evidence, but because the wrong inference (assuming that we had only Chasta Costa

and Navaho to guide us) would be hard to controvert on purely formal linguistic grounds. We learn from this and other examples of transfer of meaning that without fairly complete comparative evidence it is often dangerous to argue as to the age of a specific form of culture element on the basis of the linguistic criterion we have been considering, though the relative age of a certain general type of culture element may be satisfactorily enough established by its means.

Specialized Meanings of Words and Special Vocabularies.

While descriptive words are, in the main, apt to be of relatively recent age, they cannot all be put in the same class. Between complete lack of capability of analysis and absolute transparency of analysis there are naturally many stages. A type that is of particular interest to us is constituted by such words as are satisfactorily analysable from a purely linguistic standpoint but whose actual meaning does not correspond to that which is immediately suggested by analysis. Such words carry the history of their transfer of meaning with them. They are of value from our standpoint because a greater age may often be inferred for the culture concept implied in the linguistic analysis than for such culture concepts as are indicated by descriptive words of literal analysis. Contrast, for instance, the English words *carpet-sweeper* and *spinster*. The former is to be understood quite literally as "that which sweeps carpets," the latter does not now mean "one who spins" but "unmarried female of somewhat advanced age." *Spinster* clearly did at one time mean "one who spins," but, through association with a particular class of individuals, gradually took on a specialized meaning. From the length of time that it must have taken for so complete a transfer of meaning to become effective, a transfer including entire loss of the older meaning, we may reasonably infer the purely cultural fact that the art of spinning was known at an early time and that it was in the hands of the women; further, that it antedated by a long time the advent of the carpet-sweeper. These facts are, of course, well known to us from direct historical evidence, but it is methodologically important to show that

it is possible to ascertain them, or at least to suggest them, on the basis of a purely linguistic criterion. The age of the word *spinster* is further assured by the relative rarity of the agentive suffix-*ster* (compare *huckster*, *songster*, and stereotyped proper names like *Baxter*, *i.e.*, baker, and *Webster*, *i.e.*, weaver); this argument makes use of another linguistic criterion, of which more presently.

The application of the principle of specialization or other modification of meaning may yield interesting results as to the relative ages of two or more components of a ritual, say the Sun Dance of the Plains or the Night Chant of the Navaho. Names of rituals, dances, and other ceremonial activities are not always of clear application to the ceremonies as at present performed or understood; their analysis may not infrequently be expected to show either that one of the constituent elements, not necessarily the most prominent now, arose prior to certain others that perhaps at present give the ceremony most of its content or that a certain culture concept implied in the name is older than the ceremony as such. Thus, among the Nootka, the term *tutcha* "buying a woman" is applied to a complex of ceremonial and economic procedure which corresponds to our own marriage ceremony. Properly speaking, the term should apply only to the distribution of property on the part of the bridegroom and his supporters to the bride's family as payment for her acquisition. As a matter of fact, however, it includes all the songs, dances, and speeches that precede the "wife-purchasing" potlatch and much of which has no necessary reference to the "purchase." Thus, there is a whole class of songs known as *tutcha'yak* "for woman-purchase," whose connexion with marriage is merely conventional. Yet it is just the ceremonial procedure preceding the potlatch that is chiefly meant by the Indian when he speaks of *tutcha*. Furthermore, the fact that the bride's family immediately distributes the gifts to their own villagers and, still more important, that they may in the near future return the gifts with a dowry of privileges and a potlatch distribution of as great value as or even greater value than the property received as "wife-purchase" frequently reduces the "buying of woman" as a type of marriage to little

more than a form. Nevertheless, the cultural value of the term *tutcha* lies precisely in the fact that it implies a purely economic wife-purchasing form of marriage as lying back of the present marriage complex with its secondary accretions of ceremonial procedure and weakening of economic significance.

Here we may say a word as to the inferential importance for cultural chronology of a specialized vocabulary defining a whole culture complex. We find on an analysis of the terminologies of the different complexes that go to make up a culture that they differ considerably in the completeness and precision with which the single elements constituting them are symbolized by words. Of two cultural complexes we naturally assign a greater antiquity to that possessing the more ramified vocabulary, particularly if the vocabulary consists largely of non-descriptive words. Contrast, for instance, the extensive and highly distinctive vocabulary concerned with the breeding and use of cattle (*cow, ox, bull, steer, heifer, calf, cattle, beef, veal, butter, cheese, whey, curds, cream, to churn, to skim*—all unanalysable terms of evidently considerable age) with the more meagre and less distinctive vocabulary of such an industry as, say, the growing of oranges.¹ Linguistic evidence alone would make out a strong case for the greater age of cattle breeding and the dairy industry than of orange growing. Arguments of this type can frequently be applied with profit to the study of American culture. The great age of such complexes as sea-mammal hunting among the Nootka and Eskimo, canoeing among the West Coast tribes and Eastern Algonkin, agriculture among the Iroquois, and the gathering and preparation for food of wild roots and seeds among the Plateau tribes is in nearly every case attested by an appropriately rich vocabulary. On the other hand, the complexes of more recent age, say the decorative art of the Utes or the Ghost Dance religion, seem to make use of less extensive and distinctive vocabularies. I should go so far as to say that no study of a culture complex is historically complete without a thorough investigation of the range and nature of its vocabulary.

¹ In many modern industries quite extensive and explicit vocabularies have grown up, to be sure, but they are largely technical in character and of strictly limited appeal and thus lie rather apart from the main channel of linguistic history.

Inferences from Grammatical Evidence.

GRAMMATICAL TREATMENT OF CULTURE WORDS.

So far we have dealt only with words as such and with their analysis, where possible, into their constituent elements. Something of historical value may, further, be gleaned from the grammatical treatment of culture words. In every language there are a number of grammatical processes and elements that have ceased to be alive, as it were, that are no longer productive of new analogies, but that appear restricted in use to a limited number of stereotyped forms. Such grammatical features are clearly only survivals of features that were formerly more typical and more freely usable. They imply a considerable age for the words that they affect. This matter becomes of cultural interest when the words affected by irregular grammatical processes are of cultural reference. In this case we may infer a like antiquity for the culture concept itself. Thus, the antiquity that we have already demonstrated for cattle breeding in our own culture is further implied by such grammatical irregularities as the *-en* plural of *oxen*, the poetic plural *kine* for *cows*, and the change of *-f* to *-v-* in the plural *calves* and the verb *to calve*. Irregularities of this sort are not uncommon in American languages and are practically always indicative of the great age of the words that illustrate them and, generally speaking, of the associated concepts. Thus, in Nootka, three uncommon and evidently unproductive types of plural formation are the change of final *-t* to *-h*, reduplication with *a*-vowel, and reduplication with inserted *-t-*. Now these irregular types are respectively illustrated in *ħa'wi·ħ* "chiefs" (singular *ħa'wit*), *qaqo·t* "slaves" (singular *qo·t*), and *:a:t:entt* "dogs" (singular *:eni·tt*; *:aittc-* is used as stem in all derivatives); from which we can with some degree of safety infer that a clearly defined chief's class, the institution of slavery, and the domestication of the dog belong to a remote antiquity in this area. Similarly, the singular and plural of the Tsimshian term for "chief" (*səm'ɔ:gid*: *səmgigad*) form a quite irregular and unparalleled set of forms in that language, though they are in this case not incapable of at least partial analysis (*səm-* "very, real"; *gad* "man," *gigad* "men").

The criterion of morphologic irregularity, however, can be safely applied only positively, hardly negatively; that is, we may conclude with reasonable certainty that a culture concept associated with an archaic linguistic process is itself an old one, but we cannot be sure that a culture concept expressed by a word whose grammatical treatment is perfectly normal is of relatively recent origin. The reason for this is the ever present tendency for less well represented grammatical features to be ruled out by the analogy of other better represented ones of like function; not only do the forms of new words follow the most regular analogies present in the language but many of the old stock are remodelled in accordance with these analogies. This process is known to linguists as analogic levelling.¹ Thus, while such irregular plurals as *sheep* and *oxen* are of positive cultural value as indicating a great age for the domestication of sheep and cattle among the ancestors of the English (contrast such regular plurals as *elephants* and *tigers*, both of these animals becoming known at a much more recent period), it would be erroneous or at least unwarranted to infer from such regular forms as *horses* and *goats* that these animals were not domesticated at as early a date. The retention of a grammatical archaism is in almost every specific case governed by factors beyond our power of analysis; in other words, it is an accident. It must also be borne in mind that languages differ very much in the readiness with which they allow analogical levelling to operate. Some, like Takelma, seem to put up with a good deal of formal irregularity; others, like Yana or Paiute, while they may exhibit great complexity of structure, keep their formal machinery in well regulated grooves. This difference in formal tendency is clearly based on psychological factors that we do not need to elucidate here.

¹ Analogic levelling and phonetic change are the two most important tendencies that make for linguistic variation. Analogic levelling is precisely the process that is illustrated by the child's *mans*, *runned*, and *brang*. These and similar examples merely lack the sanction of adult usage. Such a preterit as *worked* (for older *wrought*) was originally as gross a solecism as *brang* or *bringed* for *brought*.

CULTURAL VALUE OF GRAMMATICAL ELEMENTS.

In the cases that we have so far discussed the cultural content of the word has been borne by its radical portion, the stem. In some of the typically polysynthetic languages of America, however, non-radical elements, that is affixes, which are often possessed of very concrete significance, may imply a reference to some element of culture. As the process which turns an originally independent stem into a derivative affix is necessarily a slow one, the presence of such affixes, particularly when there is no longer an etymologic relation between them and any of the independent stems of the language, is generally good evidence of their age and, by inference, of that of the culture concept it embodies. Owing to the specialized character of the affix, as compared with the independent stem, the former has an even greater *a priori* claim to antiquity than the non-descriptive stem. Naturally the caution as to transfer of meaning, which we have already dealt with in the case of independent stems, is equally operative here; indeed, we may quite generally suspect the specific cultural application of an affix to be due to the turning over of an element of originally wider range of meaning to the exclusive use of a culture concept of growing importance (thus, we might easily conceive the gradual loss in the future of the wider agentive and instrumental function of English *-er* and its specialization into a cultural affix denoting "complex piece of machinery" on the basis of such forms as *typewriter*, *receiver*, *smelter*, *reaper*, and *developer*). Such a caution, however, would not seriously invalidate the use of our linguistic criterion, as a considerable period must be assumed to have elapsed before such specialization could be effected; it merely lessens somewhat the remoteness of cultural perspective implied by the existence of the affix.

One of the most interesting types of elements of this sort is constituted by such numeral classifiers as refer to objects of cultural interest. The presence in Yurok, *e.g.*, of numeral classifiers referring specifically to woodpecker-scalps and obsidian blades is in a high degree symptomatic of the great age of the custom of prizing these objects as valuable forms of property and further implies that the keen sense of property evinced by

these Indians is by no means a recent development. Similarly, the occurrence in both Salish and Tsimshian of numeral classifiers defining canoes necessitates the conclusion that both groups of tribes have not only been acquainted with the canoe from time immemorial, but have long been dependent on it in the pursuit of their livelihood; this comes out even more strongly in the case of Tsimshian, which employs entirely distinct stems for "one" and "two" when these numbers refer to canoes. Further, the fact that Nootka has numeral classifiers specifically referring to such units of measurement as fathoms, spans, finger-widths, and board-lengths, is the best kind of evidence for the antiquity among these Indians of the use of units of measurement, a cultural trait, furthermore, that presupposes a well-developed property sense of long standing. It is, indeed, more than probable that the glimpses into the past afforded by the numeral classifiers of Yurok, Tsimshian, Salish, and Nootka reach back farther than the origin of many, if not most, of the social and ceremonial features of these tribes. Another interesting example of a group of affixes of cultural reference is afforded by several Nootka suffixes that refer to ceremonial procedure, *e.g.*, *-o'it* "to ask for something as a gift in a girl's puberty potlatch," *-to'la* "to give a potlatch for someone," *-inl* "to give a feast of some kind of food (in a potlatch)." Such elements clearly indicate that at least certain cultural concepts connected with the potlatch are of great age among the Nootka.

Negative evidence of the sort that we are considering can hardly be looked upon as significant in view of the fact that it is only exceptionally that grammatical affixes of cultural reference are found altogether. The weakness of such negative evidence would be at its greatest when used to compare the ages of the same culture element among different tribes, unless possibly the languages of these tribes were strictly comparable in structure. Thus, the complete structural dissimilarity of Hupa and Yurok robs of all its significance the fact that in the former the emphasis on woodpecker-scalps and obsidian blades finds no reflex in grammatical structure, though this emphasis is equally strong in the culture of both tribes.

GEOGRAPHICAL DISTRIBUTION OF CULTURE WORDS.

Diffusion versus Common Heritage.

We now turn to the geographical distribution of linguistic data. The mode of argumentation is here essentially the same as that employed in studying the distribution of culture elements; in other words, the more extended the geographical distribution of a culture word, the older the word and, by inference, the older its associated concept. Owing to the ease with which borrowed culture elements are renamed, whether by means of a transfer of meaning of an old term or by means of a new descriptive term, the method must be used with great caution. There are, however, two factors in regard to which the evidence derived from linguistic data is generally less liable to misinterpretation than that which is directly derived from the distribution of culture.

In discussing the distribution of a culture element we found that it was in many cases practically impossible, or at least difficult, to distinguish between similarity due to diffusion from a certain centre and similarity due to retention of the element by tribes originally forming part of one and the same cultural community. For reasons which we cannot here take up fully it is, on the other hand, very frequently possible to distinguish between a word of native origin and one which has been borrowed from without. Applying this to the problem of distribution, we find that we are often able to distinguish between cultural terms that have been inherited in common by the languages forming a linguistic stock or subdivision thereof and cultural terms that have passed beyond the limits of such a group and been taken up by one or more languages of an alien group. Naturally, it is also very possible that a culture term travels from one language to others of the same linguistic group, so that the problem arises of how to keep apart primary stock words from such as have been diffused within the genetic group. Roughly speaking, we may say that the criteria for such distinction are the same as for the more fundamental distinction we have first mentioned; the criteria are merely more delicately

applied, greater emphasis being placed on specifically dialectic linguistic features. Even when a doubt remains as to whether a culture term is to be looked upon as of indigenous or alien origin, a minimum date, in terms of one or more linguistic features, can be assigned to its introduction; this possibility is, of course, of great chronologic importance.

The second helpful linguistic factor that I have in mind is a corollary of the first. Owing to the very nature of linguistic evidence, we can not only in specific instances determine the negative fact that a word is of foreign origin (this is merely another way of stating that it is not of native origin), but proceed to the positive conclusion that it has of necessity been borrowed from a particular language. As soon as we are able to do this, we have a powerful argument for ascribing the origin of the culture element in question to one tribe rather than another and thus gain some idea of the sequence in which the element was assimilated by the different tribes of a region.

Borrowing of Culture Words.

MORPHOLOGICAL EVIDENCE.

The evidence that stamps a word as of foreign origin, insofar as it is of a purely linguistic nature, is either morphological or phonetic. It may, of course, involve both criteria at the same time. It is a pretty safe rule for most languages that words of more than a certain length¹ must be capable of at least partial analysis into elements (stem and formative elements) characteristic of the language. If such an analysis is impossible, there is very good reason to suspect the word to be of foreign provenience, to have been borrowed from a language in which the standard radical length is great enough to tolerate the word in question without analysis or in which it is capable of morphological analysis. Thus, such thoroughly assimilated English words as

¹ What might be termed the standard length of radical elements differs greatly in different languages. In some it is a syllable (among such languages there are some in which a consonant plus a vowel is the norm, others in which the normal stem consists of a consonant plus a vowel plus a consonant), in others two or even three syllables; a norm of three-syllabled radicals is certainly not common, however.

hurricane, *moccasin*, and *tomato* are incapable of analysis into English stems and formative elements; as their length is well beyond the normal one for English stems, we conclude that they are borrowed words and are confirmed in our conclusion by more direct evidence. Incidentally this effectually clears the path for a study of the culture-history of the moccasin as a style of footwear that has become popular in certain circles among the whites in America and of the growing of the tomato for food purposes.

A good American Indian example of the morphological criterion of borrowed words is the Nootka *tlo·kwa·na*, the term applied to the wolf ritual, the chief ceremonial complex of these Indians. The normal Nootka stem is monosyllabic, consisting generally of a consonant plus a vowel plus a consonant; quite infrequently it is a sound group of two syllables, while trisyllabic stems are entirely absent. The word *tlo·kwa·na* looks as though it ought to be analysable into a stem *tlo·kw-* plus a suffix *-a·na*, but these elements have no meaning in Nootka. We, therefore, suspect the word to be of foreign origin. Turning to Kwakiutl, we not only learn that the similar word *dlo·gwala* is applied to a wolf dance performed during the winter ceremonial but also—and this is more to the point here—that it is readily analysable into a verb stem *dlo·gw-* “to be powerful” plus a common durative suffix *-(a)la*. The important cultural inference must be drawn that at least certain elements in the wolf ritual of the Nootka have been assimilated from the neighbouring Kwakiutl. A similar line of reasoning leads me strongly to suspect that the Nootka term *topa·ti*, meaning any privilege that is obtained by inheritance, is of foreign origin, and this in spite of the fact that it indicates one of the most fundamental aspects of Nootka culture. However, I have not as yet succeeded in connecting the word with any foreign linguistic elements. Should it eventually prove, after all, to be a native Nootka word, it would have to be considered as of great antiquity, as no descriptive meaning whatever now attaches to it. The most instructive instances of the borrowing of culture words are those which, like Nootka *tlo·kwa·na*, can be definitely traced to a specific language, for in these the direction of diffusion is established.

But the morphological criterion sometimes fails us, notably in the case of short words which nowhere yield to analysis. We may be quite certain that the diffusion of a culture word is in part due to borrowing without our being in a position to say, from the linguistic evidence alone, in what direction the borrowing must be understood to have taken place. Considerations of another sort may often enable us to determine or surmise this direction, but even at the worst the linguistic evidence retains its value as immediately demonstrative of the fact of diffusion. A good instance of such ambiguity is the distribution of the word for "tobacco" among the Diegueño in southern California, the Shasta in northern California, and the Takelma in southwestern Oregon. There is no doubt that Diegueño *uɸ*, Shasta *o·ɸ*, and Takelma *o·^uɸ*¹ are indicative of the gradual diffusion of the cultivated tobacco (very likely the name properly applies to only a particular species of native tobacco) over a large part of western North America, but it seems impossible, at least for the present, to ascribe the origin of the word to one rather than another of these languages. If a south to north spread of the culture plant is surmised, it is on other than purely linguistic evidence. The distribution of a widespread word for "dog" in western North America (e.g., Nahuatl *chichi*, Yana *cucu*, Takelma *tsixi*)² presents a similar cultural problem.

PHONETIC EVIDENCE.

Where the morphological criterion can not be employed, the phonetic one is sometimes of service. It rests on the fact that languages differ in their systems of phonetics, sounds or combinations of sounds that are usual in one being absent or at best rare in the other. Generally speaking, such phonetic features of a borrowed word as are strange to the borrowing language are replaced by their closest available equivalents, so that the word frequently assumes a deceptive appearance of being thoroughly at home. Thus, the English word *rum* ap-

¹ Diegueño (a Yuman dialect) and Shasta are both Hokan languages and are thus remotely related, but it is highly improbable that this particular concordance rests on anything but culture diffusion. Takelma, so far as known, is not related to the Hokan languages.

² Which can be easily reconstructed, on both internal and comparative evidence, to *tsisi*.

pears in Lower Umpqua as *lam*, in Nootka as *na·ma*, neither of these languages possessing an *r*-sound, while Nootka also lacks *l*. Similarly, the Nootka word *tlo·kwa·na* "wolf ritual," though no doubt borrowed from Kwakiutl *dlo·gwala*, presents no phonetic characteristics that are untypical of Nootka, the un-Nootka sounds *dl*, *gw*, and *l* of the Kwakiutl original being respectively replaced by *tł*, *kw*, and *n*, the nearest Nootka correspondents.

It does sometimes happen, however, that sounds otherwise foreign to a language are preserved in certain words of demonstrably foreign origin and that, generalizing from these, it is possible to establish the alien provenience of other words involving the same sound. Thus, it can be shown in English that the voiced sibilant *j* (as in French *jeu*, *âge*) is never found in words of native origin but is restricted in its occurrence to foreign, chiefly French, Latin, and Greek words, in which it either goes back to an original *j* (as in *rouge*) or, more often, to an original *zy* (as in *pleasure*, *erasure*, *aphasia*).¹ The value to English culture-history of these facts may be illustrated by reference to such a word as *garage*, in which both the *j*-sound and the place of the accent point to a foreign, specifically French, origin. The culture-historical inference that the automobile and garage are elements due to French influence can, of course, be made on more direct evidence, but it is none the less important from a methodological standpoint to realize that phonetic evidence alone strongly suggests it.

Not infrequently a sound, while of native origin in certain positions, occurs in certain other positions only in foreign words. Thus, while the sounds *z* and *dj* in medial and final position are common enough in native English words (e.g., *as*, *fleas*, *chosen*; *edge*, *fledgling*), initially they occur only in foreign, more particularly French, Latin, and Greek words (e.g., *zeal*, *zoology*; *Jew*, *just*, *John*). The culture-historical value of such distinctions comes out clearly in estimating the age of such words as *judge*, *jury*, and *general* and, to a certain extent, of the culture concepts

¹ In words like *erasure* and *closure*, *j* developed from *zy*, inasmuch as original Latin *-sūra*, via French *-sure*, i.e., *-züre*, became *-zyure*, *-zyur*. In words like *aphasia* and *cohesion*, original intervocalic *-si-* became voiced non-syllabic *-zy-*. Native English *-zy-*, whence *-j-*, arises only optionally in sentence phonetics, e.g., *äju* from *äz yu* (i.e., *as you*).

connected with them. Frequently, also, the foreign provenience of a word is indicated by a combination of sounds each of which may be freely used in native words in all positions (*e.g.*, *-ps-* or *-ps* in Greek and Latin words, such as *rhapsody*, *apse*, *Cyclops*, *lapse*; such English forms as *lips* and *sips* are hardly comparable, as they can be readily resolved into *p*-stem plus *s*-suffix).

A couple of examples from American Indian languages will indicate the usefulness of the phonetic criterion in the recognition of loan words. In Haida *m* is a comparatively rare sound at best; initially it does not seem to occur in undoubtedly native words at all. The word *mat* "mountain goat," evidently related to the Tsimshian *mati*, is, therefore, clearly a loan-word from the latter language, not the reverse; the fact that the mountain goat is not found on Queen Charlotte islands, the home of the Haida, naturally strengthens the argument, but is not really necessary to it. If the word for "mountain goat" is borrowed in Haida from Tsimshian, there is good reason to believe that the mountain-goat crest, one of the less prominent crests of the Haida, was borrowed by them from the Tsimshian also, an inference which is confirmed by other testimony. In chronologic terms this means that the mountain-goat crest is of later origin among the Haida than among the Tsimshian. A similar problem is presented by the Upper Chinook word for "buffalo," *i-duiha* (also "bull"; *a-duiha* "buffalo-cow, cow") with its rather anomalous *h*, a sound occurring only rarely in Chinookan. Some of the Upper Chinook were in the habit of accompanying their Shahaptian neighbours on the annual buffalo hunt on the western plains, but this habit must have been of very recent origin, so that a non-descriptive word for "buffalo" is almost certain, on purely cultural evidence, to be of foreign origin. Thus the anomalous phonetics of *i-duiha* agrees well with the cultural evidence, though I have not been able to determine its prototype.¹

¹ Can it possibly be related to Cheyenne *hotu'a* "bull" (see *American Anthropologist*, N.S. vol. 8, 1906, p. 18)?

Common Heritage of Culture Words.

CHRONOLOGICAL INFERENCES.

Of special interest are such culture-historical words as are distributed over a number of tribes speaking related languages or dialects, this distribution not being due to secondary diffusion but to dialectic retention of an old word that formed part of the vocabulary of the common prototype of the languages or dialects concerned. Allowing for the caution imposed by a possible change of meaning,¹ a consideration of such words throws much light on many of the older elements of culture possessed by the tribes to whom the languages belong. As is well known, interesting and valuable results have been obtained in this way in the culture-history of the Indo-germanic, Semitic, and other old world groups of peoples, but in aboriginal America the application of the method is hardly in its infancy. Its value to cultural chronology lies chiefly in this, that the culture concepts associated with the more widely distributed words of a dialectic group (linguistic stock) reach back to a more distant past, other things being equal, than those of more local distribution. Further, as between a culture word distributed over a certain area by dialectic differentiation and a culture word distributed over an equivalent area by borrowing, the greater antiquity must be accorded the former, the splitting up of a language into a number of dialects being a much less rapid process than the diffusion of a word.

A good example of the former type of inference is presented by some of the Athabaskan words for "house." That both the quadrangular plank house of the Hupa and the earth lodge (hogan) of the Navaho are, from the standpoint of older Athabaskan culture, chronologically secondary to the round bark tent is neatly indicated by linguistic evidence, the common Athabaskan word for "house," *ye*, *yěx* (Kato *ye*; Anvik *yax*; Ten'a *yax*; Carrier *yax*; Chipewyan *ye*; Hare *yi*; Loucheux *je*) being respectively replaced by *xonta* and *hoyan* in these languages. Many more such examples could be adduced, but, as already

¹ Such caution, however, is far less frequently applicable to a word of identical or like meaning in a number of related languages than when our view is limited to a single language. Independent parallel development of meaning in two or more languages is not unknown (cf. Athabaskan *llcl* "fire-drill" as developed to "matches" above), but its probability rapidly lessens with the number of the languages compared.

remarked, the value of the method has hardly begun to be realized among Americanists.

HISTORICAL VALUE OF OPERATION OF PHONETIC LAWS.

It must be acknowledged that in particular cases it is not always easy to distinguish between a word independently inherited by a number of languages from a common prototype and one which has spread by diffusion within the limits of a group of genetically related languages. Ordinarily the distinction is rendered comparatively easy by the fact that the borrowed words do not show the influence of such dialectic phonetic laws as operated before their adoption. However, a borrowed word may happen to have come into use at a period prior to the operation of all such phonetic laws as are capable of affecting it, in which case it exhibits all the phonetic characteristics of words belonging to the oldest ascertainable stratum of the language. The chronological value of such words remains great, for they give us a minimum age, in terms of often relatively datable phonetic laws, for their adoption and that of the concepts associated with them.¹

A good example of such a culture word is the Nootka *hei'na*, which is identical in origin with the Kwakiutl *xwe'la*. This term designates the supernatural quartz which is capable of flying and which, among the Nootka, plays an important part in the conduct of and in the beliefs connected with the Wolf Ritual. Nootka possesses both *x* (velar voiceless spirant) and *xw* (labialized velar voiceless spirant), though these are not common sounds; original Wakashan (Kwakiutl-Nootka) *x* and *xw* have both regularly developed to *h* (velarized aspiration).² Moreover, Kwakiutl *l* regularly corresponds to Nootka *n*.³

¹ The phonologic criterion renders great service in the stratification of the borrowed culture words of a language. Countless examples could be given from the history of the culture languages of the old world. Thus, the minimum age for the origin of the probably borrowed hemp culture among the Germanic-speaking tribes is indicated by the phonetic form of the Germanic word for the plant (cf. Anglo-Saxon *hæneþ*); comparison with such forms of the word as Greek *kannabis* shows clearly that this culture, or at least the knowledge of the plant, was older than the characteristic Germanic changes of original *k* to *h* and of original *b* to *p*, whence results an inference of very considerable antiquity, an antiquity exceeding that, e.g., of the acquaintance of the West Germanic tribes with Christianity (cf. Anglo-Saxon *cyrice* "church," i.e., *kürike*, from Greek *küriake*: note retained *k* in Anglo-Saxon, and West Germanic generally, because this word was borrowed subsequently to the time at which the shift from *k* to *h* operated).

² Nitinat and Makah, however, preserve Wakashan *x* and *xw*.

³ Kwakiutl *'l*, when "hardened" from *l*, corresponds to Nootka *'y*, not *'n*. This consideration may ultimately prove Nootka *hei'na* to be borrowed from Kwakiutl *xwe'la*, not cognate with it. Nootka *n* would then have been substituted for Kwakiutl *l* as its nearest acoustic equivalent.

Hence the two words look somewhat as if they might be independent developments of a common Wakashan prototype. Could we be sure of this, we would have to assign a very great antiquity to the Wakashan belief in the supernatural power of flying quartz. At the very least, the word must have been borrowed by Nootka before the $x-h$ shift, whence we may infer that it belongs to the oldest stratum of Kwakiutl ritualistic influence.

Another example of this type is afforded by the Uto-Aztekan word for "metate, grinding stone," *metla-(tli)*; this appears in Nahuatl as *metla-tl*, in Huichol as *mata*, in Luiseño as *mala-l*, in Southern Paiute as *mara-tsi-*. Linguistically there is nothing to show that these correspondences do not rest on dialectic development from a common Uto-Aztekan source; should this interpretation prove sound, we would be dealing with a very old culture element antedating the tremendous movements of population that have scattered the Uto-Aztekan peoples from Idaho to Central America. If, on the other hand, there should be other than linguistic evidence to show that the metate was gradually diffused from an Aztec centre of distribution to the Sonoran and Shoshonean tribes to the north, the linguistic evidence would still prove a great antiquity for this diffusion, as it must have been consummated before the operation of a number of distinctive phonetic laws of considerable geographical distribution and, therefore, age (assimilation in Sonoran and Shoshonean of $e-a$ to $a-a$; spirantization of intervocalic $-t-$ to Luiseño $-l^1$ and Southern Paiute $-r^2$).³

GEOGRAPHICAL DISTRIBUTION OF LINGUISTIC STOCKS.

Concept of Linguistic Stock.

Probably the most valuable service that linguistics can render ethnology is the setting up of groups of languages into linguistic stocks. The concept of a linguistic stock is of par-

¹ This applies to all Luiseño-Cahuilla dialects, also to Tübatulabal.

² This applies to all Ute-Chemehuevi and Shoshoni-Comanche dialects.

³ It would not be necessary to assume that Uto-Aztekan *tl* had not yet become *t* in Sonoran and Shoshonean, as *tl* of a borrowed Nahuatl word would in these languages be replaced by its nearest phonetic equivalent, *t*. Compare such Castilianized words as *metate* and *ocote*.

ticular interest to us because, while based on descriptive data, it is strictly historical in character. It implies the former existence of a comparatively undifferentiated language which, by gradual phonetic and morphologic changes, has diverged into distinct forms of speech. Each of these, of course, may in turn become ramified, and so on. Hence a proper classification of genetically related languages always tends to assume the form of a genealogical tree. While it may be possible to say with certainty that a given number of languages are genetically related, it is a much more embarrassing task to prove the corresponding negative, that certain languages, because offering few, if any, obvious traits of similarity, cannot be considered as going back to a common origin. It is not difficult to realize that the process of linguistic differentiation may, after a vast lapse of time, bring about such profound dissimilarity of phonetics, structure, and vocabulary that the positive proof of genetic relationship may be a difficult or even impossible task. Even the most inclusive classification of aboriginal American languages that could be made would, therefore, have positive validity as far as it went without justly allowing the necessity of the negative corollaries that might be drawn.

Chronological Inferences from Linguistic Differentiation as to Movements of Population.

COMPARISON OF DISTINCT LINGUISTIC STOCKS.

The greater the degrees of linguistic differentiation within a stock, the greater is the period of time that must be assumed for the development of such differentiations. The greater the geographical extent covered by a linguistic stock, the greater is the period of time that must be allowed for the movements of the tribes speaking its languages. The latter criterion of relative age holds good, however, only insofar as geographical extent is proportionate to degree of linguistic differentiation. A tribe may overrun a large territory at a very much more rapid rate than a language splits up into two divergent dialects. Hence, while the extensive geographical spread of a language undoubtedly

forms a favourable condition for dialectic differentiation, it is not necessarily directly proportionate to the latter. Yet the chronological value of the facts of linguistic distribution, particularly when emphasis is placed on remoter time perspectives, depends on the linguistic differentiation implied in such distribution. Let us glance at a few American examples.

The Algonkin languages proper¹ are spoken over a vast territory reaching from the Atlantic to the Rockies and from Hudson bay to the Ohio valley. In this area are (or were) spoken a large number of distinct languages and dialects (*e.g.*, Naskapi, Montagnais, Cree, Micmac, Abenaki, Ojibwa, Menomini, Fox, Shawnee, Delaware, Natick, Miami, Arapaho, Cheyenne, Blackfoot). There can be no doubt that a very great lapse of time (probably several millennia) must be assumed to account for the geographical distribution and dialectic differentiation of the Algonkin languages proper. As compared with the Algonkin area, that of the Penutian languages of California (Yokuts, Miwok-Costanoan, Maidu, Wintun),² though large, is quite restricted. Are we justified in assuming from this that the movement of Algonkin peoples³ from a relatively small area occupied by a people of homogeneous speech greatly antedated the analogous movement of Penutian peoples? Not unless we can show that the differentiation of the Algonkin languages is not less profound than that of the Penutian languages. As a matter of fact, the morphologic and lexical differences that obtain between even the most divergent Algonkin languages, say Chey-

¹ That is, without the inclusion of the remotely related Yurok and Wiyot of California.

² This is the Penutian stock as defined by Dixon and Kroeber. I have collected evidence to show that it extends into Oregon, embracing Takelma, Coos, and Lower Umpqua, possibly certain other languages. For the sake of simplicity, however, I here use the term Penutian in its more restricted Californian sense.

³ This and similar terms ("movement of people of such and such speech") do not by any means imply that all or even most of the present population speaking dialects of the stock have of necessity primarily descended from a relatively homogeneous group speaking the hypothetical prototype of the stock. A language may spread to neighbouring peoples without any great displacement of population. Linguistic displacement due to cultural contact is here included under "movement of tribes of related speech." In actual fact, to be sure, I believe it may be shown that far-reaching movements of population were quite frequent in aboriginal America. I doubt if linguistic displacement was as typical a process in America as in the old world, though it is by no means unknown (thus, the Tlingit-speaking Tagish were originally an Athabaskan tribe; the Nootka-speaking Ho'pa'tcas'ath were originally a Salish tribe; the Tewa of Hano are adopting Hopi as their language).

enne and Micmac, while by no means inconsiderable, are of comparatively little moment when set by the side of analogous differences obtaining between two such Penutian languages as Yokuts and Miwok. The fact that Cheyenne and Micmac were understood to be clearly related at a time when Yokuts, Costanoan, Miwok, Wintun, and Maidu¹ were looked upon as mutually independent linguistic stocks, in itself indicates that the differentiation exhibited by the latter languages cuts deeper into the historic past than that found in the Algonkin languages. There can be no doubt, then, that the distribution of Penutian-speaking tribes antedates, as a whole, the scattering of Algonkin peoples from a comparatively restricted centre. If under the term "Algonkin" we include the remotely related Yurok and Wiyot of California, a comparison with the Californian Penutian group as to relative age of linguistic differentiation might well favour the former. However, too little is known of the details of either problem to enable us to answer such a question as yet.

LINGUISTIC DIFFERENTIATION OF EARLIEST MAN IN AMERICA.

One corollary of great historical interest follows from our argument as to the chronological significance of linguistic differentiation. If the apparently large number of linguistic stocks recognized in America² be assumed to be due merely to such extreme divergence on the soil of America as to make the proof of an original unity of speech impossible, then we must allow a tremendous lapse of time for the development of such divergences, a lapse of time undoubtedly several times as great as the period that the more conservative archæologists and palæontologists are willing to allow as necessary for the interpretation of the earliest remains of man in America.³ We would then be driven

¹ Gatschet's surmise of the genetic relationship of Costanoan and Miwok was the first step towards the recognition of the Penutian stock.

² In spite of the reduction in American linguistic stocks which we have of late years been witnessing, there is no reasonable prospect, as far as I can see, of our ever getting beyond the assumption of a quite considerable number of isolated linguistic groups in North and South America.

³ While it is absurd to juggle with specific figures, it may be interesting to note that at a recent scientific meeting a well known American palæontologist, who is at the same time conversant with the problem of early man in America, expressed himself as believing ten thousand years an ample, indeed a maximum, period for the human occupation of this continent, as far as the geological evidence is concerned. This was only a somewhat reluctantly given personal opinion, but it very likely represents the general consensus of conservative opinion on the subject. Ten thousand years, however, seems a hopelessly inadequate span of time for the development from a homogeneous origin of such linguistic differentiation as is actually found in America.

to the alternative of assuming that the linguistic differentiation of aboriginal America developed only in small part (in its latest stages) in the new world, that the Asiatic (possibly also South Sea) immigrants who peopled the American continent were at the earliest period of occupation already differentiated into speakers of several genetically unrelated¹ stocks. This would make it practically imperative to assume that the peopling of America was not a single historical process but a series of movements of linguistically unrelated peoples, possibly from different directions and certainly at very different times. This view strikes me as intrinsically highly probable. As the latest linguistic arrivals in North America would probably have to be considered the Eskimo-Aleut² and the Na-dene (Haida, Tlingit, and Athabaskan).³

DIFFERENTIATION OF LINGUISTIC STOCKS INTO DISTINCT LANGUAGES.

The criterion of linguistic differentiation has time value not only in relation to independent linguistic stocks but also, and indeed even more typically, in relation to the cognate languages of a single linguistic stock. The major divisions of a linguistic stock represent the oldest differentiations within it and the geographical distributions of each of these divisions as unit must be considered as of equal weight in an attempt to reconstruct the earliest ascertainable location and movements of the stock as a whole. In other words, the geographical centre of gravity, historically considered, of a linguistic stock is not determined directly on the basis of all the dialects of the stock but rather on the basis of its major divisions, regardless of whether

¹ Or so remotely related at best that the fact of relationship could hardly be gathered from the descriptive evidence.

² The Siberian Eskimo would, of course, still have to be considered as representing a regressive movement from America to Asia.

³ From these considerations follows a highly important theoretical, if not at present practical, corollary. Should it ever be possible to prove a tangible genetic relationship between Asiatic and American languages, this would by no manner of means necessarily or even probably involve more than a small proportion of American languages. I do not consider it at all inconceivable that, *e.g.*, the Eskimo-Aleut and Na-dene languages may ultimately be shown to have respective Asiatic affinities but no American ones. I need hardly insist that these remarks have a merely theoretic validity.

they are greatly ramified into subdivisions or not.¹ The procedure in estimating the relative chronological significance of further linguistic ramifications is analogous to the above. To put it briefly, we must aim to weight the historical equivalence of languages at every step rather than to make historical inferences from their number.

To show how these considerations affect the reconstruction of earlier movements of linguistically related tribes we may briefly take up two or three actual problems. The geographical centre of distribution of the Algonkin tribes proper would seem to be the upper Great Lakes, but before we can attach an historical interpretation to this purely descriptive fact it is well to weight the linguistic evidence. As far as we can see at present, the Algonkin languages (aside from their more remote kinsmen, Yurok and Wiyot) fall into four equivalent groups—Blackfoot, Arapaho, Cheyenne, and Central-Eastern Algonkin,² the last including the greater number of Algonkin languages. In other words, the divergence between Arapaho and Blackfoot, despite the fact that their speakers are in both cases typical Plains tribes, reflects a linguistic (and tribal) differentiation of greater antiquity than that of two such distant tribes as the Naskapi and Shawnee. At best, therefore, the Great Lakes can be considered as the historical centre of distribution of only the Central-Eastern tribes; while the linguistic equivalence with this group of the Blackfoot, Arapaho, and Cheyenne, each of which lie to the west of the former, pushes the historical centre of distribution of the Algonkin tribes proper considerably to the west.³ We

¹ I am assuming here that it is possible to determine the linguistic divisions which are historically equivalent; further, that a distinction can be drawn between a historically fundamental divergence and a relatively secondary one, even though the latter is of greater descriptive magnitude (*e.g.*, English seems, on the whole, more distinct from German than does German from Danish, yet it can be shown very convincingly that the English-German divergence is historically secondary to the German-Danish, better West Germanic-Scandinavian, one). To justify these assumptions would lead us too far into the technique of comparative philology.

²Since this was written, I have come to consider it highly probable that Cheyenne and Arapaho belong to a single group of Algonkin.

³This naturally has its significance in view of the presence of Yurok and Wiyot still farther west. It is hardly an accident that the greatest linguistic differentiation of Algonkin proper is found in the west, not in the Atlantic region.

can hardly avoid the inference that in the remoter past the general movement of Algonkin tribes was from west to east.¹

A particularly neat instance of the oft-times conclusive nature of linguistic evidence for the determination of the direction of a movement of population is that of the distribution of the Athabaskan languages. As is well known, these languages are spoken in three geographically isolated areas, a very large northern area (interior of Alaska to near Hudson bay), a Pacific area (southwestern Oregon and northwestern California), and a southern area (Arizona, New Mexico, and western Texas). As long as it is assumed, as is generally done on purely geographical grounds, that these three dialectic groups represent the equivalent major divisions of Athabaskan, there is no pressing reason of a linguistic nature for considering one rather than another as the historical centre of distribution. As a matter of fact, however, while the southern and Pacific dialectic groups are each of them clearly homogeneous and contrast with other groups of Athabaskan dialects,² I do not see that any evidence has been given to indicate that the northern dialects form a single group equivalent to these. Though these dialects have not yet been satisfactorily classified, it seems at least probable to me that they may ultimately be grouped into two or more major divisions, each equivalent in differential value to the southern group. Thus, I do not see that the divergence between, say, Carrier and Loucheux is less profound than that which obtains between, say, Chipewyan and Navaho. This being so, it would seem that the historical centre of gravity lies rather in the north than in either of the other two regions and that the occupation of these latter was due to a southward movement of Athabaskan-speaking tribes. It is important to observe that the argument is not in any way dependent on the fact that the northern tribes cover a much vaster territory than those of the other two groups or

¹ This in no way contradicts the fact that at a much later period there was clearly a westward drift of certain Algonkin tribes (Western Cree, Plains Ojibwa, Arapaho, Cheyenne). I am not inclined to believe that the western movement of the Cree is part of the same general movement of population that gave the Blackfoot their present home.

² Thus, Pacific Athabaskan as unit is characterized by *s* and *c* as reflexes of both original *s* and *z* and *c* and *j* respectively; in morphology we may note the frequent use of *-c* in "indefinite" tense forms of many verbs. Southern Athabaskan as unit is characterized by the development of original palatalized *k*- sounds to *ts*- sounds.

even directly on the fact that probably a larger number of distinct dialects are spoken in the north than elsewhere. The argument for the northern provenience of the Athabaskan tribes is clinched by a further linguistic fact, namely that the Athabaskan dialects form one of the three major divisions of the Nadene stock, the other two being Haida and Tlingit. The fact that the latter are spoken in the northwest coast area so emphatically locates the historical centre of gravity of the stock in the north that it becomes completely impossible to think of the Athabaskan tribes as having spread north from California or the southwest.¹

The value of the criterion of linguistic differentiation for a reconstruction of the relative ages of tribal movements, to a considerable extent also of the direction of such movements, has doubtless been made evident. If, as may sometimes happen, the linguistic evidence seems to run counter to other evidence or to a prevailing theory, it should not be lightly discarded as irrelevant to historical problems. While it may be forced to yield in the face of powerful testimony pointing to contrary conclusions, its claims always deserve serious consideration. Had the historical significance of linguistic differentiation been more generally appreciated, I doubt if the theory, for example, of the distribution of Eskimo tribes from the west coast of Hudson bay as a centre would have received quite such ready acceptance. I do not wish expressly to oppose this theory, but merely to point out that it does not well agree with the linguistic evidence. The Eskimo linguistic stock is sharply divided into two dialectic groups, Eskimo proper and Aleut. Inasmuch as Aleut is confined to Alaska and as a considerable number of distinct Eskimo dialects are spoken in Alaska besides, it seems very probable to

¹ There is also specific linguistic evidence in both the Pacific and southern dialectic groups of Athabaskan tending to show that Athabaskan is intrusive in those areas. In another paper I have attempted to demonstrate that the Hokan languages (Shasta-Achomawi, Chimariko, Karok, Pomo, Yana, Esselen, Yuman, Seri, Chontal, probably also Chumash and Salinan) are related to the Coahuiltecan languages of the western Gulf coast (Coahuilteco, Comecrudo, Cotoname, Tonkawa, Karankawa, possibly also Atakapa); if this is correct, the Athabaskan tribes now separating Yuman from Karankawa and Tonkawa could hardly be other than intrusive. Similarly, in northern California, the territory lying between that of the Pomo and that of the linguistically related Shasta, Chimariko, and Karok is largely occupied by Athabaskan tribes. Finally, in Oregon, Coos and Lower Umpqua are cut off from the remotely related Takelma (the evidence for this I expect to produce in a future paper) by Athabaskan dialects.

me that the earliest at present ascertainable centre of dispersion of the tribes of Eskimo stock lies in Alaska.

GEOGRAPHICAL DISTRIBUTION OF PHONETIC AND MORPHOLOGIC FEATURES.

It is well known to students of language that striking phonetic and morphologic similarities are not infrequently found between neighbouring languages that, so far as can be ascertained, are in no way genetically related. Such resemblances, insofar as they are not merely fortuitous, must be due to the assimilatory influence exerted by one language over another. This may either mean that in the acquisition of an originally foreign language that gradually displaces the native one certain habits of speech (phonetic or structural peculiarities) are carried over by the speakers from the old into the new language¹ or that such peculiarities are, more or less unconsciously² and through the medium of bilingual individuals, created in one language on the model of analogous features in the other. Which of these factors is involved in any particular case it may often, or generally, be quite impossible to tell.

One of the most striking American examples of phonetic accord overriding fundamental linguistic independence is the occurrence in a considerable number of West Coast linguistic groups (Na-dene; Tsimshian; Kwakiutl-Nootka, Chemakum, Salish; Chinookan; Lower Umpqua, Coos) of velar consonants, voiceless laterals, and glottalized ("fortis") stops. These far-reaching resemblances in rather uncommon types of sounds are likely to be in part due to such assimilatory processes as we have mentioned. Examples of important morphological resemblances in unrelated, but geographically contiguous languages are the sex gender of Coast Salish and Chinookan; the occurrence of numeral classifiers and distributive (or plural) reduplication both in Tsimshian and in Kwakiutl-Nootka, Chemakum, and

¹ Just as we, when a foreign language has been but imperfectly mastered, involuntarily substitute familiar for difficult and unfamiliar sounds and literally translate morphological and syntactic usages that are familiar to us into the new medium of communication.

² Sometimes no doubt also consciously. Fashions in speech, peculiar to one language, particularly if associated with ceremonial or literary values, may be directly imitated by the speakers of another.

Salish;¹ the instrumental verb prefixes of Maidu, Shoshonean, Washo, and Shasta-Achomawi;² and the local verb suffixes of Maidu, Washo, and of Shasta-Achomawi and Yana.³ There seems no practical alternative in these and many other cases that might be mentioned to the hypothesis of morphological influence exerted by one language on another. The point of historical interest in such assimilatory phenomena is that they necessarily presuppose a very long period of tribal contact. They may, therefore, be employed as indications of the relative age of a tribal contact or even of the former existence of a contact now disrupted. While I do not think that too free a use should be made of this criterion for historical purposes, difficult as it generally is to isolate and apply, there is no doubt that in special cases it can yield interesting results.

An inference or two from some of the morphological facts listed above will be helpful towards the understanding of the method of application. Tsimshian, as far as we know, is genetically unrelated to either the Na-dene languages to the north or the group comprising Kwakiutl-Nootka, Salish, and Chemakum to the south. Culturally the Tsimshian Indians are more closely affiliated with the Na-dene tribes of the Pacific coast (Haida and Tlingit) than with even the northernmost of the latter tribes (Kitamat, Bella Bella; Bella Coola). Nevertheless, the morphologic resemblances noted above between Tsimshian and the languages south of it, when contrasted with the lack of correspondingly significant resemblances between Tsimshian and Na-dene, seems to be indicative of a much earlier contact of the Tsimshian with the Kwakiutl and Salish than with the Haida and Tlingit. Such contact need, of course, not have been in precisely the same territory as now occupied by the tribes nor need their geographical relation have been quite the same. Should

¹ These three, as long ago pointed out by Boas, have several important morphological traits in common. They may well prove to be genetically related.

² In this respect Maidu differs from the other Penutian languages (Yokuts, Miwok-Costanoan, Wintun, also Coos and Lower Umpqua; Takelma also, but quite independently of Maidu though perhaps again under Shasta-Achomawi influence, has developed a set of instrumental verb prefixes of a rather different type). On the other hand, instrumental verb prefixes seem characteristic of certain Hokan languages (Shasta-Achomawi, Chimariko, Pomo).

³ Here again Maidu differs from all the other Penutian languages (including Takelma, Coos, and Lower Umpqua). Once again the peculiarity is characteristic of several Hokan languages (Yana, Shasta-Achomawi, Chimariko, Karok).

our inference prove correct, it would probably mean that the great bulk of the cultural development exclusively peculiar to the Haida, Tlingit, and Tsimshian is of much more recent date than the earliest contact between the Tsimshian and the Kwakiutl and Salish.

A comparison of Maidu and Wintun seems to lead to a similar line of argument. Both of these languages are in contact with northern Hokan languages, Maidu with Shasta-Achomawi and Yana, Wintun with Yana, Shasta-Achomawi, Chimariko, and Pomo. Moreover, the Wintun territory extends considerably to the north of that of the Maidu. If anything, therefore, one would have expected Wintun to show more of a Hokan influence than, or at least as profound a Hokan influence as Maidu, instead of which we find that two of the most striking morphological features of Hokan, instrumental prefixes and local suffixes in verbs, are shared by Maidu but not by Wintun.¹ It hardly seems too rash to infer from this that the Maidu have been in longer contact with Hokan-speaking tribes than the Wintun. This can only mean that at an earlier date the Maidu were the northernmost of the Californian Penutian tribes and that the Wintun have only later gradually spread north from the lower Sacramento valley, where they were probably only in contact with other Penutian tribes and with the southern Yuki. Before this northward movement of the Wintun we may suppose the Pomo to have been in contact with their remote linguistic kinsmen, the Yana and Shasta-Achomawi.

CONCLUDING REMARKS ON METHOD.

We have now completed our survey of the methods available for a reconstruction of time perspectives in aboriginal American culture-history. Anything like real completeness is, of course, entirely out of the question here, my chief aim having been rather to suggest some of the more important avenues of approach than to write a systematic methodology or to treat in

¹ It should be remembered that both Wintun and Maidu are Penutian languages and are, therefore, related. The linguistic psychology of the two languages seems, indeed, to be very much the same, so that, other things being equal, Wintun might be supposed to be as readily susceptible to Hokan influence as Maidu.

exhaustive detail of the practical application of our methods to the more important problems of American ethnology.

A possible impression that may have been left in the mind of the reader is that I attach an exaggerated importance to the historical value of purely inferential evidence as contrasted with the more obvious direct evidence derived from a study of datable documents and from stratigraphic archæology. Such an impression is certainly not intended. I would not dispute for an instant the general superiority of direct to inferential evidence in the establishment of culture sequences, but have made it more particularly my aim to show in what way, in the absence or dearth of direct evidence, the inferential data may be made to yield historical perspectives. The methods to be pursued in the handling of historical documents are relatively obvious; moreover they may be found discussed in more than one manual of historical method. As for the historical methodology of archæological research, while I consider the method of stratigraphy, where available, as probably the most fruitful of all, I have felt that it would be presumptuous for one as inexperienced in archæological technique as myself to do more than barely indicate the nature of this method. I earnestly hope that the present paper may stimulate some one better qualified than myself to prepare a systematic statement of the principles of such a methodology, with special reference to the reconstruction of time sequences in American culture.

In connexion with the treatment of inferential evidence, I feel myself open to a second criticism, that of a disproportionate insistence on purely linguistic criteria coupled with an undervaluation of the data of physical anthropology. This criticism also would be directed rather at the form than at the spirit of my contentions. I freely grant that incomparably the most significant of all inferential evidence bearing on the time perspective of culture is yielded by ethnological data. That I have treated the linguistic criteria at somewhat disproportionate length is due to two reasons, the one personal, the other pedagogical. My own interest in and relative familiarity with facts of a linguistic order have doubtless betrayed me into a tendency to make rather more of them than strict justice might allow. On the other hand, the

actual historical value of linguistic criteria is so real and this value so little appreciated among Americanists generally, that it seemed pedagogically advisable, if not theoretically warranted, to somewhat overdo the emphasis on them. As for the claims of physical anthropology to more detailed consideration, I must here, too, confess that I feel too keenly my limitations in this regard to do more than briefly indicate a few possibilities. The incidental light thrown on culture history or on former movements of population by the data of physical anthropology is certainly worthy of a careful methodological treatment.

In answer to a third possible criticism, I must emphatically point out that I do not consider any single one of the inferential criteria that I have set up as necessarily valid in a specific case. An argument, *e.g.*, based on the associations formed by a culture element or on its geographical diffusion or on its linguistic representation may be entirely convincing in the handling of one problem, yet appear far-fetched or even totally inapplicable in the handling of another. Everything depends upon the specific conditions of a given problem. And, needless to say, any one criterion is never to be applied to the exclusion of or in opposition to all others. It is a comfortable procedure to attach oneself unreservedly or primarily to a single mode of historical inference and wilfully to neglect all others as of little moment, but the clean-cut constructions of the doctrinaire never coincide with the actualities of history.

If any general point should have come out more clearly than another in the course of our discussion, it is the danger of tearing a culture element loose from its psychological and geographical (*i.e.*, distributional) setting. No feeling of historical perspective can be gained for any culture element without careful reference to these settings. Another way of bringing out this point is to emphasize the necessity of historically evaluating or weighting a culture element or linguistic datum before it is employed for comparative purposes. The failure adequately to weight ethnological and linguistic data, but to rely largely on the counting of noses, is to an equal extent responsible for the historical vagaries of a Frazerian evolutionist and for those of his counterpart, the Graebnerian diffusionist.

PUBLICATIONS OF THE GEOLOGICAL SURVEY.

The Geological Survey was established in 1842 and "Reports of Progress" were issued, generally in annual volumes, from that date to 1885, the first report being that for the year 1843 published in 1845. Beginning with the year 1885, "Annual Reports" (new series) were published in volumes until 1905, the last being Vol. XVI, 1904. Many of the individual reports and maps published before 1905 were issued separately and from 1905 to the present, all have been published as separates and no annual volume has been issued. Since 1910, the reports have been issued as Memoirs and Museum Bulletins, each subdivided into series, thus:—

Memoir 41, *Geological Series 38.*

Memoir 54, *Biological Series 2.*

Museum Bulletin 5, *Geological Series 21.*

Museum Bulletin 6, *Anthropological Series 3.*

In addition to the publications specified above, a Summary Report is issued annually; and miscellaneous publications of various kinds including Reports of Explorations, Guide Books, etc., have been issued from time to time.

Publications Issued 1910-1915 Inclusive.

MEMOIRS.

- MEMOIR 1. *Geological Series 1.* Geology of the Nipigon basin, Ontario, 1910—by Alfred W. G. Wilson.
- MEMOIR 2. *Geological Series 2.* Geology and ore deposits of Hedley mining district, British Columbia, 1910—by Charles Camsell.
- MEMOIR 3. *Geological Series 3.* Palæoniscid fishes from the Albert shales of New Brunswick, 1910—by Lawrence M. Lambe.
- MEMOIR 4. *Geological Series 7.* Geological reconnaissance along the line of the National Transcontinental railway in western Quebec, 1911—by W. J. Wilson.
- MEMOIR 5. *Geological Series 4.* Preliminary memoir on the Lewes and Nordenskiöld Rivers coal district, Yukon Territory, 1910—by D. D. Cairnes.
- MEMOIR 6. *Geological Series 5.* Geology of the Haliburton and Bancroft areas, Province of Ontario, 1910—by Frank D. Adams and Alfred E. Barlow.
- MEMOIR 7. *Geological Series 6.* Geology of St. Bruno mountain, Province of Quebec, 1910—by John A. Dresser.
- MEMOIR 8. *Geological Series 8.* The Edmonton coal field, Alberta, 1911—by D. B. Dowling.
- MEMOIR 9. *Geological Series 9.* Bighorn coal basin, Alberta, 1911—by G. S. Malloch.
- MEMOIR 10. *Geological Series 10.* An instrumental survey of the shore-lines of the extinct lakes Algonquin and Nipissing in southwestern Ontario, 1911—by J. W. Goldthwait.
- MEMOIR 11. *Topographical Series 1.* Triangulation and spirit levelling of Vancouver island, B.C., 1909, issued 1910—by R. H. Chapman.
- MEMOIR 12. *Geological Series 11.* Insects from the Tertiary lake deposits of the southern interior of British Columbia, collected by Mr. Lawrence M. Lambe, in 1906, issued 1911—by Anton Handlirsch.
- MEMOIR 13. *Geological Series 14.* Southern Vancouver island, 1912—by Charles H. Clapp.
- MEMOIR 14. *Biological Series 1.* New species of shells collected by Mr. John Macoun at Barkley sound, Vancouver island, British Columbia, 1911—by William H. Dall and Paul Bartsch.
- MEMOIR 15. *Geological Series 12.* On a Trenton Echinoderm fauna at Kirkfield, Ontario, 1911—by Frank Springer.
- MEMOIR 16. *Geological Series 13.* The clay and shale deposits of Nova Scotia and portions of New Brunswick, 1911—by Heinrich Ries assisted by Joseph Keele.
- MEMOIR 17. *Geological Series 28.* Geology and economic resources of the Larder Lake district, Ont., and adjoining portions of Pontiac county, Que., 1913—by Morley E. Wilson.
- MEMOIR 18. *Geological Series 19.* Bathurst district, New Brunswick, 1913—by G. A. Young.
- MEMOIR 19. *Geological Series 26.* Geology of Mother Lode and Sunset mines, Boundary district, B.C., 1914—by O. E. LeRoy.
- MEMOIR 20. *Geological Series 41.* Gold fields of Nova Scotia, 1914—by W. Malcolm.

- MEMOIR 21. *Geological Series 15.* The geology and ore deposits of Phoenix Boundary district, British Columbia, 1912—by O. E. LeRoy.
- MEMOIR 22. *Geological Series 27.* Preliminary report on the serpentines and associated rocks in southern Quebec,, 1914—by J. A. Dresser.
- MEMOIR 23. *Geological Series 23.* Geology of the coast and islands between the Strait of Georgia and Queen Charlotte sound, B.C., 1914—by J. Austen Bancroft.
- MEMOIR 24. *Geological Series 16.* Preliminary report on the clay and shale deposits of the western provinces, 1912—by Heinrich Ries and Joseph Keele.
- MEMOIR 25. *Geological Series 21.* Report on the clay and shale deposits of the western provinces, Part II, 1914—by Heinrich Ries and Joseph Keele.
- MEMOIR 26. *Geological Series 34.* Geology and mineral deposits of the Tulameen district, B.C., 1913—by C. Camsell.
- MEMOIR 27. *Geological Series 17.* Report of the Commission appointed to investigate Turtle mountain, Frank, Alberta, 1911, issued 1912.
- MEMOIR 28. *Geological Series 18.* The Geology of Steeprock lake, Ontario—by Andrew C. Lawson. Notes on fossils from limestone of Steeprock lake, Ontario, 1912—by Charles D. Walcott.
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- MEMOIR 34. *Geological Series 63.* The Devonian of southwestern Ontario, 1915—by C. R. Stauffer.
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- MEMOIR 37. *Geological Series 22.* Portions of Atlin district, B.C., 1913—by D. D. Cairnes.
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- MEMOIR 47. *Geological Series 39*. Clay and shale deposits of the western provinces, Part III, 1914—by Heinrich Ries.
- MEMOIR 48. *Anthropological Series 2*. Some myths and tales of the Ojibwa of southeastern Ontario, 1914—by Paul Radin.
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- MEMOIR 50. *Geological Series 51*. Upper White River district, Yukon, 1915—by D. D. Cairnes.
- MEMOIR 51. *Geological Series 43*. Geology of the Nanaimo map-area, 1914—by C. H. Clapp.
- MEMOIR 52. *Geological Series 42*. Geological notes to accompany map of Sheep River gas and oil field, Alberta, 1914—by D. B. Dowling.
- MEMOIR 53. *Geological Series 44*. Coal fields of Manitoba, Saskatchewan, Alberta, and eastern British Columbia (revised edition), 1914—by D. B. Dowling.
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